

THE NEW
POPULAR ENCYCLOPEDIA

634/RR2/ETRY

The New Popular Encyclopedia

174
2
x
x

A General Dictionary of the
Arts and Sciences, Literature
Biography, History, Geography
&c.

A New and Revised Edition of the Popular Encyclopedia
with
A Supplement to every volume
and
An Extensive Series of Plates in Colour and in Black-and-White

Issued under the General Editorship of
CHARLES ANNANDALE, M.A. LL.D.
Editor of Ogilvie's "Imperial Dictionary"

Assisted by
MANY SPECIALISTS
IN
THE VARIOUS BRANCHES OF HUMAN KNOWLEDGE

Volume II

THE GRESHAM PUBLISHING COMPANY
LONDON AND GLASGOW
1902

LIST OF PLATES AND MAPS.

VOLUME II.

	Page
PORTRAITS OF MEN OF THE TIME.—II. - - - - -	<i>Frontispiece.</i>
BAROMETER.—Different Varieties of - - - - -	43
BATRACHIANS.—Frogs, Toads, and other Amphibia - - - - -	69
BLOOD.—General Distribution of the Blood-vessels, in Colour - - - - -	212
BOILER.—Land and Marine Boilers of Modern Type - - - - -	235
BOTANY.—I. Roots, Leaf-Buds, Woody Tissue, &c. - - - - -	276
Do. II. Leaves, Flowers, Fruits - - - - -	278
Do. III. Stem Structure, &c. - - - - -	279
BREWING.—Interior of a Brewery at Work - - - - -	332
BRIDGE.—I. Forth Bridge, Tay Bridge, &c. - - - - -	338
Do. II. Tower Bridge, Brooklyn Bridge - - - - -	340
THE BRITISH ISLES AND ADJACENT COASTS.—Map of - - - - -	365
BUTTERFLIES AND MOTHS.—I., in Colour - - - - -	455
Do. II., in Colour - - - - -	455

[illegible]

[illegible]

THE NEW POPULAR ENCYCLOPEDIA

A DICTIONARY OF GENERAL KNOWLEDGE.

BAKEWELL, a market-town of England, county of Derby, between Buxton and Matlock. The parish church is a fine old Norman and Gothic structure, restored in 1841-52, and contains a number of interesting monuments. There are many tepid chalybeate springs and a bath-house. Pop. in 1881, 2502; in 1891, 2748; in 1901, 2850.

BAKEWELL, ROBERT, an English agriculturist, celebrated for his improvements in the breeding of sheep, cattle, and horses, and for his successful exertions to diffuse a knowledge of the principles of breeding, was born at Dishley, in Leicestershire, in 1725. He commenced experiments in breeding sheep about 1745, upon his father's farm at Dishley, which gave name to a breed of cattle. He died in 1795. Much of his life was spent on experiments on breeding, and in travelling through the country acquiring and diffusing information regarding it.

BAKHTCHISSARAI, or **BAKTOUM-SERAI**, an ancient town of Russia, in the Crimea, 15 miles s.w. of Simferopol. It stands at the bottom of a narrow valley, hemmed in by precipices, and consists chiefly of a single street, with gardens interspersed among the houses. Several mosques, embosomed among trees, overtopped by tall minarets, have a very picturesque appearance; but the old palace of the Crimean khans, now the residence of the commandant, is the most remarkable edifice. Pop. (1897), 12,956.

BAKING. See **BREAD**.

BAKU, a Russian port on the western shore of the Caspian Sea, near the extremity of the Caucasus range, on the south side of the peninsula of Apscheron. The naphtha or petroleum springs of Baku have long been known, and the 'Field of Fire,' so-called from emitting inflammable gases which were perpetually burning, has long been a place of pilgrimage with the Guebres or Fire-worshippers. From about 1872 the petroleum industry has undergone an extraordinary development here, and Baku has become a large and flourishing town. Nearly 600 wells are in operation, yielding immense quantities of crude petroleum, much of which is led in pipes to the refineries in Baku. Some of the wells have had such an outflow of oil as to be unmanageable, and the Baku petroleum now competes successfully with any other in the markets of the world, large quantities of it being conveyed by railway in tank cars to Batoum on the Black Sea to be there shipped. It is the chief port on the Caspian, the station of the Caspian fleet, and is strongly fortified. Pop. in 1870, 12,400; in 1886, 45,679; by census of 1897, 112,253. Baku is the capital of a government of same name; area, 15,177 sq. miles; pop. 329,054.

BALA, a town of Wales, in Merionethshire, on Bala Lake, amid beautiful scenery, with a theological college of the Calvinistic Methodists and intermediate

county schools. Pop. (1901), 1544. Bala Lake, though only 4 miles long and 1 broad, is the largest in Wales, and the chief source of the Dee.

BALAKLAVA, or **BALACLAVA**, a small seaport, Russia, in the Crimea, 8 miles s.e. Sevastopol. It consists for the most part of houses perched upon heights, and it has an old castle, built by the Genoese. The harbour has a very narrow entrance, and though deep is not capacious. In 1854 Balaklava became the principal landing-place of the British after the battle of the Alma. The battle of Balaklava, fought Oct. 25, 1854, when the Russians in overwhelming force were repulsed by a small body of the British, is one of the most heroic achievements of modern times, the 'charge of the light brigade' being the most glorious incident in the conflict. Pop. 742.

BALANCE, an instrument employed for determining the quantity of any substance equal to a given weight. Balances are of various forms; that most commonly used, and well known under the designation of 'the beam and scales,' consists of a supported horizontal beam capable of turning in a vertical plane round its centre. The scales or scale-pans are suspended by chains from the extremities of the beam, called the centres of suspension. Midway between the centres of suspension, and directly above the centre of motion (that is, the centre of the beam), there rises from the upper surface of the beam a perpendicular slender stem called the *tongue*, which, when the beam is level, points to the top of the piece by which the whole is suspended. A good balance is necessary, not less for the ordinary commerce of society than for the purposes of science; and there are few indeed to whom it should be a matter of indifference to know the principles of construction which contribute to the excellence of this simple and useful instrument. We shall therefore, as briefly as possible, state the properties of a good balance, and also the means by which these properties are to be secured. The characteristics of a good balance are three:—1st. That the beam should rest in a horizontal position when the scales are either empty or loaded with equal weights. 2d. A very small addition of weight put into either scale should cause the beam to deviate from the level, which property is denominated the *sensibility* of the balance. 3d. When the beam is deflected from the horizontal position by inequality of the weights in the scales, it should have a tendency speedily to restore itself and come to rest in the level, which property is called the *stability* of the balance. The remarks which follow will guide in the construction of a balance which shall possess the foregoing properties:—The arms of the beam should be exactly similar, equal in weight and length, and as long as possible. The centres of gravity and suspension ought to be in one straight line, and the centre of motion should be immediately

above the centre of gravity. The centre of motion and the centres of suspension should cause as little friction as possible, and their axes ought to be at right angles to the line which measures the length of the beam. The centre of motion ought to be a knife-edge; and if the balance requires to be very delicate, the centres of suspension ought to be knife-edges also: and if the centres of suspension be not knife-edges, the rings with which they are formed should be hard, polished, and of an oval form. There are means of testing whether or not these conditions have been observed in the construction of a balance. For if the balance have no tendency to one position more than another, when the scales are either loaded, empty, or off altogether, it is a proof that the centres of gravity and motion coincide, and the remedy is to lower the centre of gravity. If the beam is disturbed by a small addition of weight to either scale, the arm at the loaded end descending and having no tendency to resume the horizontal position, then we may infer that the centre of gravity is above the centre of motion; and it is to be observed, that the quicker the descent of the loaded arm of the beam is the farther must the centre of gravity be lowered before the beam will acquire the requisite stability. If it require a considerable addition of weight in either scale to deflect the beam from the level, we may infer either that there is too much friction at the centre of motion, or that the centre of gravity is too low. If two weights are found to be in equipoise, one being in each scale, and if, when a transfer of them is made, and that which was in the one scale is put into the other, there is no longer an equilibrium, then we may infer that the arms of the beam are of unequal lengths.

Various contrivances have been employed with a view to correct the defects of the common balance. The whole apparatus is not unfrequently inclosed in a glass case, which prevents the heat from expanding the arms unequally, or currents of air from disturbing the equilibrium. A small weight has been made to slide up or down on the tongue, by which means the centre of gravity may be raised or depressed at pleasure; and to regulate the equality of the length of the arms, a regulating screw is employed, by means of which the centre of suspension of either arm may be moved nearer to or farther from the centre of motion. Balances used for delicate purposes, such as for assaying, have the centre of motion suspended; but that centre is fixed on a pedestal, which firmly supports the whole. Various forms of hydrometer, for example Nicholson's, may be employed as balances; for these see the article *HYDROMETER*. A hydrometer with a rather large body and narrow neck, and weighing much less than its own volume of water, may be fitted up as a convenient form of balance known as the *hydrostatic balance*. This form of balance is, however, used only in very special cases, since for ordinary purposes it possesses no particular advantages. The balances which we have considered above all require an assortment of weights; and it now remains for us to describe the more important of those balances which require only one weight, but are nevertheless capable of determining a great many. Of this description is the *statera*, or Roman steel-yard, which, in all its forms, however complicated and elaborate, consists essentially of a steel lever movable around a fixed fulcrum. On one side of this fulcrum, and at a known distance from it, a fixed pan is suspended from the bar, and the body to be weighed is placed in this pan. The other arm of the lever is graduated, the divisions being shown by notches, and from it the single weight is suspended at such a distance (ascertained by trial) from the fulcrum as to counterbalance the turning-effect due to the body and the pan and produce equilibrium.

When that has been secured, we know from the principle of moments that, provided the apparatus was in equilibrium before the body and the weight were added, the number of pounds in the mass of the body multiplied by the number of units in the known distance of the point of suspension of the pan from the fulcrum must be equal to the number of pounds in the movable weight multiplied by the number of units in its distance from the fulcrum. By properly choosing the fixed distance of the pan and the value of the constant weight we may graduate the long arm of the lever so as to read off at once the weight of the body in the pan. Thus if the pan be suspended at a distance of one inch, and the movable weight be one pound, the weight of any body placed in the pan is equal to the number of inches from the fulcrum to the sliding weight in the position of equilibrium.

An extremely ingenious balance is that used in the Mint and the Bank of England for weighing 'blanks' intended to be coined into sovereigns, as well as the sovereigns themselves. The instrument is self-feeding, and when it has received a supply of blanks or sovereigns, each of them is in turn pushed into the upper orifice of a long flattened tube, which is just capable of admitting a disc of the size of a sovereign, and which is attached to a pivot at its upper end and free at its lower end. By an intricate mechanism, which without occupying too much space it would be impossible to describe, this tube is made to vibrate, so that when a blank or sovereign of full weight is admitted the lower orifice of the tube is adjusted exactly over an opening of equal size in a box or compartment beneath, which is intended to receive all the blanks of the proper weight, and when a blank either too heavy or too light is admitted, the tube is adjusted in the same way over the openings in other two compartments which are respectively intended to receive the 'too heavy' and 'too light' blanks. For an account of the spring-balance, used for measuring the force of machinery, see *DYNAMOMETER*.

BALANCE OF POWER, a political principle which first came to be recognized in modern Europe in the sixteenth century, though it appears to have been also acted on by the Greeks in ancient times, in preserving the relations between their different states. The object in maintaining the balance of power is to secure the general independence of nations as a whole, by preventing the aggressive attempts of individual states to extend their territory and sway at the expense of weaker countries. The first European monarch whose ambitious designs produced a fear of his aiming at universal monarchy, and consequently induced a combination of other states to counteract these, was the Emperor Charles V. A similar apprehension and counter co-operation took place in the end of the seventeenth century, when the ambition of Louis XIV. excited the fears of Europe. About a century later the exorbitant power and aggressive schemes of the first Napoleon led to a general combination against him of the allied sovereigns, which resulted in his repression and overthrow. More recently still we have the instance of the Crimean war, entered into to check the despotic power of Russia in her projects for coercing and ultimately engulfing the Ottoman Empire. With politicians of a certain class it was the fashion, a few years ago, to decry and impugn the principle of the balance of power, as calculated only to propagate a system of mutual hostility, and retard the cause of progress, by the expenditure both of money and life thus occasioned. There can be no doubt, however, that to the carrying out of this principle much of our own national independence, and in an infinitely greater degree, of many of the smaller and weaker European states, is fairly attributable.

BALANCE OF TRADE, a term formerly used by political economists to signify an excess of imports over exports, or of exports over imports in the foreign trade of a country, which required to be balanced by an export or import of the precious metals. According to what was called the 'mercantile system', the country which had such a balance in its favour was supposed to be in an advantageous, and the country which had it against it was supposed to be in a disadvantageous position in regard to its foreign trade, and many regulations injurious to commerce were adopted by the greatest and most intelligent nations with a view to regulate their trade favourably in regard to this assumed standard. Since the days of Adam Smith the old mercantile system has been thoroughly discredited, but the true laws which regulate the transactions of different communities with each other, and which constitute the balance of trade properly so called, are yet far from being generally understood. A few elementary positions may be laid down regarding them. First. In the exchange of commodities between different nations, as between different individuals, the tendency of the exchange is always to an equilibrium, that is, that a given amount of labour, regulated by a given amount of skill of one nation, should exchange for an equal amount of equally skilled labour of another. The actual course of exchange may often diverge very far from this equilibrium, but whenever it does diverge, it brings into operation forces sufficient ultimately to neutralize the divergence, as the supply of labour will always tend most freely to the points where it can be pursued to the greatest advantage. Second. The whole exports and imports of a community must, in general, be periodically balanced. There are communities as well as individuals which have a tendency to live upon credit, and sometimes imports may be gained in this way for which no substantial return is ever made; but generally speaking balances of national trade cannot be permanently run up, so that the whole exports of a community during a considerable period, such as a consecutive series of years, may be taken as the measure of its importing power, and *vice versa*. Thirdly. This real balance of trade does not produce any apparent balance. It is not and cannot be represented in statistics. As Adam Smith demonstrated, it is a matter of complete indifference in what sort of commodities any community pays a particular balance against it. The precious metals have no superiority over other kinds of merchandise. There is, however, one phenomenon in regard to the balance of trade which requires explanation, as it constantly causes the whole subject to be misunderstood. Any nation taking the statistics of exports and imports at its own ports, that is the value of imports as they arrive and of exports as they leave, will nearly always make the balance of its entire foreign trade in its own favour; the reason is, that the former are estimated with all the expenses of transport added, the latter entirely free of these expenses. On statistics taken on equal bases, either invariably omitting or invariably including the expenses of transit, agency, &c., it would, however, be found that some countries habitually import more than they export, while others export more than they import. The explanation of this is not that the one class makes a profit, the other a loss, on its foreign trade. Actual profit or loss, that is a more or less favourable exchange in quantity or value of labour, is not at all gauged by statistics, as it directly affects the estimated value of the articles exchanged. The explanation of the difference simply refers to the distribution of the expenses of transit. In one sense all commerce is carried on at a loss. When two countries exchange their products, there are certain expenses to pay on the exchange. The advan-

tage of the exchange consists in the fact that each gets an article it wants in place of an article it does not want, an article of which its supply is deficient, or which it has not at all, in place of an article of which its supply is superabundant. But the exchange by which this advantage is procured entails labour, and this labour must be paid for. The actual producers of the two countries, consequently, have their gross production diminished by the exchange. They have to give a portion of it to the agents who carry on the exchange. Now these agents may belong in a much greater proportion to the one country than to the other. All the ships which carry on the commerce between two countries, for example, may be built in one of them; they may be regularly managed and receive all their most valuable supplies in the same country. The ships are not actually exported, but the country which builds and manages them for the mutual benefit of its commerce with another country will necessarily import more from that country than it exports to it. It pays, in the first instance, the whole expense of transit, and the other country must ultimately contribute its share in larger exports. If these expenses could be exactly adjusted between two countries the estimated value of their whole exports would exactly balance, provided there were no cross transactions with other countries, whether the exchange between them was or was not favourable to the labour of one or the other; because if the labour of three Englishmen exchange for the labour of nine natives of Bengal, the estimated value of the labour of the nine will be exactly that of the three, and the only difference in the estimate of this value which would be made in London and Calcutta would be the expenses of transit and agency between the two places. If we suppose the whole expenses of the exchange between the two countries to be one-third of the gross produce, and the expense to be equally divided, then the three Englishmen would receive for their labour that of six Indians, while the nine Indians would receive only the labour of two Englishmen.

BALAPUR, a town of India, in Akola district, Berar, 16 miles west of Akola, with a strong fort, and a fine pavilion built of black stone. Pop. (1891), 10,250.

BALAS, a term applied to a rose-coloured variety of spinelle, often regarded as a variety of ruby.

BALASORE (*Balaswara*), a seaport town of Hindustan, presidency of Bengal, province of Orissa, in a district of the same name, of which it is the chief port. It is 180 miles s.w. of Calcutta, and situated in a very populous district, on a low dreary plain near the muddy banks of the Burabalang, and considered unhealthy during the rainy season. It is a long, straggling place, carrying on an inconsiderable traffic, but was formerly a flourishing town, having Portuguese, Dutch, and English factories. The port is formed by the river, and is 7 miles from the coast in a direct line, though the windings of the Burabalang make the distance by water 15 miles. The pop. in 1881 was 20,265; in 1891, 20,775.

BALATON, LAKE, or **PLATTENSEE**, in Hungary, 55 miles s.w. of Budapest; length, 50 miles; breadth, 3 to 10 miles; greatest depth about 40 feet; area, about 390 square miles. It receives the water of over thirty streams, of which the Szala is the largest, and communicates with the Danube by the rivers Sio and Sarviz. It abounds with fish, especially a species of perch. On the north and north-west the shores are hilly or mountainous, elsewhere generally flat.

BALBEC, or **BAALBEK**, the ancient *Heliopolis* ('city of the sun'), is situated in Turkey in Asia, in the vilayet of Syria, in the fertile valley (ancient

Cale-syria) between Lebanon and Anti-Lebanon, and near the foot of the latter, 35 miles to the north-west of Damascus. It is a small, meanly built town, surrounded by ruinous walls, containing about 2000 inhabitants, among whom there are some Christians and Jews. The early history of the city is unknown. In the time of Augustus, Heliopolis had a Roman garrison, and it received the status of a Roman colony with the title *Julia Augusta Felix*. Whether the great temple, imposing ruins of which still remain, was built by the Emperor Antoninus Pius, or by Septimius Severus, upon whose medals it appears to have been first represented, is uncertain. Of fifty-four lofty columns there are but six standing: their shafts are 54 feet high, and nearly 22 in circumference; and the whole height, including pedestal and capital, is 72 feet. The size of some of the stones with which the walls of the temple are constructed is astonishing, so that it is difficult to imagine by what mechanical expedients they were placed in their present position. Under the Emperor Constantine this temple was neglected, and it was afterwards changed into a Christian church. Thus it remained until after the irruption of the Arabians, when it fell to decay. A smaller temple, called the Temple of the Sun, adjoins the larger, and is in much better preservation. There are also remains of several other structures. Obeidah, a general of the Caliph Omar, captured the city in 748 after a vigorous defence. In 1260 it was destroyed by Hulagu; in 1400 it was pillaged by Tamerlane. An earthquake almost entirely destroyed it in 1759.

BALBI, ADRIANO, a celebrated geographer, was born at Venice in 1782, and in 1808 published his first work on geography, which procured his appointment, first as professor of geography in the College of San Michele at Murano, and subsequently as professor of natural philosophy in the lyceum at Fermo. In 1820 he proceeded to Portugal, and collected there materials for his *Essai Statistique sur le Royaume de Portugal et d'Algarve, comparé aux autres États de l'Europe, and Variétés Politiques et Statistiques de la Monarchie Portugaise*, both published at Paris in 1822. Shortly before the publication of these works he had taken up his abode in the last-mentioned city, where he continued to reside till 1832. He then returned to Italy and settled at Padua, where he died on the 14th March, 1848. Balbi's admirable and best known work, *Abrégé de Géographie, rédigé sur un Plan Nouveau* (1832), was composed during his sojourn at Paris, and has been translated into the principal European languages. He was also the author of a valuable ethnographical atlas (1826), besides other geographical and statistical works. His son edited in 1841-2 an edition of his *Scritti Geografici* in 5 vols.

BALBI, GASPARO, a Venetian merchant, born about the middle of the sixteenth century, was a dealer in precious stones; and having been led, in the course of his business, to travel first to Aleppo and then to India, published, on his return to Venice in 1590, a work entitled *Viaggio nelle Indie Orientali*, giving a very full and interesting account of his journey, which had occupied him eleven years.

BALBINUS, DOMITIUS CALPURNIUS, a Roman senator who had been twice consul, and was elected by the senate joint-emperor with Maximus, in opposition to Maximinus, who was supported by the legions of Germany. He and his colleague had reigned little more than a year when the praetorian bands forced their way into the palace and murdered both, 238 A.D.

BALBOA, VASCO NUÑEZ DE, born at Xeres de los Caballeros in 1475; one of the Spanish adventurers who pursued the path which Columbus had pointed out, and sought to make their fortunes in America.

The Spanish court granted them full permission to make discoveries, without giving them sufficient support. Balboa, after having dissipated his fortune in Spain, went to America, arrived at the Isthmus of Darien, and soon became the leader of a small troop of Spaniards. He succeeded in founding a colony in these regions, either winning the inhabitants by kindness, or subjecting them by force. A dispute having taken place between two of his companions on the division of a quantity of gold, an Indian, who perceived the eagerness of the Spaniards for it, offered to show them a country where this precious metal was used for the meanest vessels. He led them to the coast of the Pacific Ocean (Sept. 1513), where the way to Peru was open before them. Balboa, however, did not venture to attack Peru with his troop of 150 men. He was satisfied with getting information, and with taking possession, in the name of the King of Spain, of the great ocean, which it is believed no European had beheld before him. After four months he returned to Darien loaded with gold and pearls. Here he found a new governor, Pedrarias Davila, whom he was commanded to obey by an order of Ferdinand. Though surprised at this ingratitude he complied, and in the following year was appointed viceroy of the South Sea. Davila was apparently reconciled to him, but soon after, under pretext of neglect of duty, ordered him to be tried and condemned to death. Balboa was beheaded in 1517, at the age of forty-two years. Pizarro, who afterwards completed the discovery of Peru, had served under him.

BALBRIGGAN, a town and seaport, Ireland, county of and 18 miles N.W. from Dublin; celebrated for its hosiery manufactures, more especially cotton stockings. There is a linen-weaving factory, and fishing is also carried on. It is a well-built place with good sea-bathing. Pop. in 1891, 2273.

BALCONY, in architecture, is a projection from the outer wall of a building, usually over the door or in front of a window, and supported by columns or brackets, and surrounded by a balustrade. Balconies were not used in ancient buildings. In the East the roof of the house then served, as it still does, similar purposes on a larger scale to those of the balcony in Europe. Balconies properly so styled came into fashion in the middle ages, and have since played a considerable part in tales and adventures, both serious and comic, of chivalry and gallantry. The balcony is frequently used, either covered or open, as a place for growing plants.

BALDER. See **NORTHERN MYTHOLOGY**.

BALDWIN I, Emperor of Constantinople, a prince memorable not only on account of his talents, but as having been the founder of the short-lived dynasty of Latin sovereigns of the Eastern Empire. He was born in 1172, and was hereditary Count of Flanders and Hainault. Having joined in the fourth Crusade, he distinguished himself by his courage and conduct in several actions which ensued; and when Constantinople, in 1204, was taken by the French and Venetians, Baldwin was unanimously elected Emperor of the East. His new subjects revolted against him, being excited by Joannice, king of Bulgaria, whom he had offended by rejecting his proffered alliance. The insurgents seized Adrianople, in besieging which city Baldwin was taken prisoner by the King of Bulgaria, and probably soon after put to death, with circumstances of great cruelty, in 1206. The uncertainty of his fate gave rise to a remarkable deception. Twenty years after his disappearance a hermit exhibited himself in Flanders professing to be the long-lost prince, and was at first gladly received as such by his former subjects. He was, however, taken to the French court, where

he was without difficulty detected, and perished as an impostor.

BALDWIN III., King of Jerusalem from 1143 to 1163, a model of that chivalry which grew up in the period of the Crusades, from the sentiments of honour, justice, devotion, and love. The Crusaders had established Counts of Tripoli and Edessa and Princes of Antioch. The feudal dominions of the Christians extended as far as Tarsus and Cilicia; but the vassals of Baldwin were always in rebellion against him or engaged in conflicts with each other. Against them and the new hosts of Crusaders, against the Knights of St. Mary, the Templars, and the Hospitallers, the Saracen heroes, Saladin, Noureddin, Zenghi, and Seifeddin, fought with equal fanaticism and equal dissensions among themselves, but with better fortune. In the army of Baldwin were sometimes seen Saracens valiantly fighting under the banner of the cross. His unhappy reign was the last struggle to establish the Christian chivalry, the tournaments, and the knightly orders in the East. With it fell the feudal constitution in that quarter, both civil and ecclesiastical. Baldwin's death was soon followed by the total ruin of his kingdom.

BALE, JOHN (in Latin, *Baleus*), an English ecclesiastic, was born at Cove, near Dunwich, Suffolk, in 1495. Although educated a Roman Catholic, the Reformation having found its way into England, he became a Protestant. In early life he enjoyed the protection of Lord Cromwell; but after that nobleman's execution his own warmth of temper and the intolerance of the Catholic party rendered it necessary for him to retire into the Netherlands, in 1540. On the accession of Edward VI. he returned to England, and was in the first instance presented to the living of Bishop's Stoke, Southampton, and soon after nominated to be Bishop of Ossory, in Ireland. Here, on his preaching the reformed religion, his clergy either oppressed or forsook him; and so violent was the popular fury against him that in one tumult five of his domestics were murdered in his presence. The accession of Mary necessarily added to his danger; and quitting his diocese, he lay some time concealed in Dublin. After enduring many hardships he was enabled to reach Switzerland, where he abode until the death of Mary. On his return to England he contented himself with the calm enjoyment of a prebendal stall at Canterbury, where he closed his stormy life in 1563, in the sixty-eighth year of his age. He was so bitter a controversialist that he earned the title of 'bilibus Bale'. The only work which has given him distinction among authors is his *Scriptorum Illustrum Majoris Britanniae Catalogus*; or *An Account of the Lives of Eminent Writers of Britain*. This account, which, according to the title, commences with Japhet the son of Noah, reaches to the year 1557, at which time the author was an exile on the Continent. It is compiled from various writers, but chiefly from the antiquary Leland. With considerable allowances for the strong bias of party zeal this work may still be read with advantage, although it is not without errors in regard to dates, and the needless multiplication of the titles of books. With every abatement, however, the principal work of Bale must ever be considered valuable as the foundation of English biography. Part of its value it derives from the fact that the author made use of manuscripts that have since been lost.

BALE, BASIL, or BASLE. See **BASLE**.

BALE, COUNCIL OF. See **BASLE (COUNCIL OF)**.

BALEARIC ISLES, a group of islands in the Mediterranean, situated near the coast of Valencia, in Spain, comprising Majorca (in Spanish, *Mallorca*), Minorca, Iviça, and Formentera. They form a

Spanish province named Baleares, having an area of 1758 square miles, and 306,926 inhabitants in 1897. The name Baleares was given them, according to the ancient belief, because the inhabitants were famous for their skill in alinging (Greek, *ballain*, to throw). The Balearic slingers distinguished themselves in the army of Hannibal. In later times the Romans took possession of the islands; afterwards the Vandals, under Genserio, and in the eighth century the Moors, from whom they were taken by James I., king of Arragon, 1220-84. They then constituted a kingdom, which in 1375 was united to Spain. The British conquered Minorca in 1708, lost it again in 1782, and relinquished it to Spain by the treaty of 1783. It was retaken in 1798 and given up by the treaty of Amiens in 1802. See separate articles.

BALEN, HENDRIK VAN, and JOHN VAN, father and son, historical painters, the former born in 1560, the latter in 1611, both at Antwerp. The former died in 1632, the latter in 1654. Pictures by each are still extant in many European galleries, and considered valuable. Those of Hendrik are chiefly classical, religious, and allegorical. He was the first master of Van Dyck and Snijders.

BALFE, MICHAEL WILLIAM, the composer of several popular operas, was born in Dublin, 15th May, 1806. He received his first instructions in music from his father and Charles Horn. In his seventh year he performed one of Viotti's concertos before the public; at sixteen he performed the part of the Wicked Huntman in *Der Freischütz* at Drury Lane. In 1825 he went to Italy, wrote the music for a ballet *La Peyrouse* for the Scala at Naples, and in the following year fulfilled an engagement to sing at the *Théâtre-Italien*, Paris, with moderate success. He returned to Italy, and at Palermo was given his first opera, *I Rivali* (1830). For five years he continued singing and composing with somewhat careless haste sundry operas for the Italian stage, which are now forgotten. In 1835 he came to England and had his *Siege of Rochelle* brought out at Drury Lane. It hit the popular taste, and was quickly followed by others equally successful in this respect. Part of this success was no doubt due to the great artists who took the leading characters, Malibran, Grisi, Lablache, Rubini, and the other stars of that time; but the works had high merits of their own, being marked by brilliancy, melody, and fertility of invention. His operas continue popular in England and elsewhere, among the chief being *The Bohemian Girl* (the most popular of all), *The Rose of Castile*, *The Daughter of St. Mark*, and *Satanella*. The composer died 20th Oct. 1870. His posthumous opera, *The Talisman*, was brought out in London in June, 1874, with great success.

BALFOUR, SIR ANDREW, Bart., M.D., an eminent botanist and physician, was the fifth and youngest son of Sir Michael Balfour of Denmilne in Fife, and was born at that place on the 18th January, 1830. After completing his studies at St. Andrews and London he resided for some time in different parts of France. He then returned to London, but two or three years later entered upon a continental tour, which lasted for four years. On returning to his native country Balfour settled at St. Andrews as a physician. But his merit was too conspicuous to suffer him to remain long there. In the year 1870 he removed to Edinburgh, where he immediately came into great practice. Upon his settlement in Edinburgh he had found the medical art taught in a very loose and irregular manner. In order to place it on a more respectable footing he planned, with Sir Robert Sibbald, the Royal College of Physicians; and of that society his brethren elected him first president. When the college undertook the

publication of a Pharmacopœia, the whole arrangement of the materia medica was committed to his particular care. It made its appearance in 1685, and is regarded as superior to any Pharmacopœia of that era. Not long before his decease his desire to promote the science of medicine in his native country, joined to the humanity of his disposition, led him to project the foundation of a hospital in Edinburgh. This institution subsequently became the Royal Infirmary. Sir Andrew died in 1694, in the sixty-fourth year of his age. He and Sir Robert Sibbald founded the Edinburgh Botanic Gardens about 1680. In 1700 his son published a series of his familiar letters.

BALFOUR, SIR JAMES, a Scottish lawyer and public character of the sixteenth century, was a son of Sir Michael Balfour of Mountquhanny in Fife. In youth, being designed for the church, he made considerable proficiency, not only in ordinary literature, but in the study of divinity and law. While still a young man he joined with the conspirators who, after murdering Cardinal Beaton, held the castle of St. Andrews against the governor Arran. He shared the fate of Knox and others of his companions in being sent to the French galleys, from which he was released in 1550. He seems to have afterwards joined in the proceedings of the reformers, but only with courtier-like temperance, and without going into the enthusiasm in favour of Calvinism. He was preferred to the ecclesiastical appointment of official of the archdeaconry of Lothian, and after betraying the secrets of the reformers became rector of Flisk, a parish in his native county; and subsequently he was appointed, through the favour of Queen Mary, a Lord of Session, chief of the first Commissary Court (1563), and member of the privy-council. In the beginning of the year 1567 Sir James Balfour was appointed governor of Edinburgh Castle. In this important situation he naturally became an object of great solicitude to the confederate lords, who, in the ensuing May, commenced a successful rebellion against Queen Mary. After the queen was dethroned he was admitted by Murray a lord of his privy-council, and made president of the Court of Session, but in 1568 he was deprived of this office because suspected of intriguing with Mary. Shortly before Murray's death in 1570 he was imprisoned on account of a charge preferred against him by the succeeding regent, Lennox, who taxed him with a share in the murder of Darnley. He contrived, however, to get released without trial. Balfour outlived Lennox, and was serviceable in bringing about the pacification between the king's and queen's party under Morton in 1573. He would appear to have been encouraged by Morton in the task of revising the laws of the country, which he at length completed in a style allowed at that time to be masterly. Morton afterwards thought proper to revive the charge brought by Lennox against Sir James, who was consequently obliged to retire to France, where he lived for some years. He returned in 1580, and revenged the persecution of Morton by producing against him on his trial a deed to which he had acceded, in common with others of the Scottish nobility, alleging Bothwell's innocence of the king's murder, and recommending him to the queen as a husband. Sir James died before the 24th of January, 1583-84. He seems to have been actuated in his public policy entirely by selfish opportunism. *The Practicks of Scots Law*, the earliest text-book on the subject, which passes under his name and is believed to have been partly his work, continued to be used and consulted till nearly a century after his decease, when it was supplanted by the Institutes of

Lord Stair. It was printed in 1754 by the Ruddimans, along with an accurate biographical preface by Walter Goodal. It is still of interest to the legal antiquarian as forming a curious repertory of the old practices of Scottish law.

BALFROOSH, or **BARFURUSH**, a town of Persia, province of Mazanderan, 95 miles N.E. of Teheran. It stands on the Bawool, here crossed by a solid brick bridge, about 12 miles from its mouth in the Caspian, and consists of spacious but ill-formed streets, and indifferent brick houses, covering a large area in the midst of a forest. It is celebrated for its moulahs or learned men, who have here about thirty schools or colleges; and carries on a very considerable trade, especially in silk and cotton, and in importing iron and petroleum. Pop. about 50,000.

BALI, the most westerly of the Lesser Sunda Islands, in the Indian Archipelago, belonging to Holland. It is crossed by the parallel of 8° 30' S., and is situated between Java and Lombok. The greatest length is nearly 90, and the greatest breadth 55 miles; area, about 2075 square miles. It is of a triangular shape, and consists chiefly of a series of volcanic mountains, the loftiest of which, Agung or Bali Peak, has a height of 10,500 feet, and after long quiescence became again active in 1843. It is well wooded and has a fertile and well irrigated soil; the most important cultivated crop is rice; coffee, tobacco, &c., are exported. It forms one colony with Lombok, the seat of the administration being at Buleleng, on the north coast of Bali. The population of Bali is 802,930.

BALIOL, or **BALLIOL**, JOHN DE, founder of Balliol College, Oxford, was the son of Hugh de Baliol, a leading English baron in the reign of Henry III. Baliol strongly attached himself to the king in his struggles with the barons. In 1263 he laid the foundation of Balliol College, which was completed by his widow. This nobleman received a great accession of wealth and influence by his marriage with Devorguila, one of the co-heiresses of Allan of Galloway, a great baron of Scotland, whose wife was Margaret, the eldest daughter of David, earl of Huntingdon, brother of William the Lion. It was on the strength of this genealogy that his son John Baliol, under the influence of Edward I., became temporary King of Scotland. Baliol died in 1289.

BALIOL, or **BALLIOL**, JOHN (DE), King of Scotland, son of the above John de Baliol. On the death of Margaret, the Maiden of Norway, and grandchild of Alexander III., Baliol, being at the head of the English interest in Scotland, claimed the vacant throne by virtue of his descent from David, earl of Huntingdon, brother to William the Lion, king of Scotland. Robert Bruce (grandfather of the famous king) opposed Baliol; but having submitted to the arbitration of Edward I., the decision was in favour of Baliol, who did homage to him for the kingdom, Nov. 12, 1292. Baliol, however, did not long enjoy the crown, for, having remonstrated against the power which Edward assumed over Scotland, he was summoned to his tribunal as a vassal. Irritated at this, Baliol concluded a treaty with France, on which a war with England immediately commenced in 1296. Edward overran Scotland, and at Brechin Baliol surrendered his crown to the English monarch, who sent him and his son Edward to London to be imprisoned in the Tower. The pope interceded for them, and they were liberated in 1299. Baliol retired to his estate in France, where he died in 1315. See **SCOTLAND** (History).

BALISTÆ, or **BALLISTÆ**, a kind of machines for besieging, or attacking the besiegers, in use among the ancients, by which heavy stones were thrown, and

which thus served the purpose of the more modern cannon. Balistes were often used in conjunction with the battering-ram, the former being directed against the battlements or the upper parts of a wall, while the latter attempted to shatter the lower portion. Stones weighing as much as 800 lbs. are said to have been thrown by some of these machines. The baliste were different from the *catapultæ*, the latter being for throwing darts. See CATAPULTS. The mechanism of these machines is not quite clear.

BALKAN (anciently called *Hæmus*), a lofty and rugged chain of mountains, extending from Cape Eminch Burum on the Black Sea, in Eastern Roumelia, in a westerly direction to the borders of Servia, and forming the southern boundary of the basin of the Danube. In the west it is connected with the rest of the extensive and much ramified mountain-system of the south-eastern peninsula of Europe, the Despot-Dagh Mountains running southward from its near Sofia to the Ægean Sea, while other branches extend through Servia and Montenegro, and southward through Albania, and thus connect it with the Pindus chain and the mountains of Northern Greece. Its length is over 200 miles; the average elevation is about 3000 feet, but the group of the Khoja Balkans in the w. have a mean height of 6500 feet. The highest summit is Jumrukhal, 7786 feet. The Balkan forms the watershed between the streams flowing northward into the Danube, and those flowing southward to the Ægean. The chief of the latter is the Maritza. The range, which has a gradual descent on the N., presents on the S. a somewhat steep escarpment, and has always been considered the greatest natural bulwark of the Ottoman Empire against enemies on the European frontiers. Yet in the Russo-Turkish war of 1877-78 the Russian troops managed to cross it without any great difficulty, though they had to encounter a stubborn resistance at the Shipka Pass (4370 feet). Here a Turkish army of 32,000 men surrendered to the Russians. The range now forms the southern frontier of Bulgaria, dividing it from Eastern Roumelia. The whole of the south-eastern peninsula of Europe is known as the Balkan Peninsula.

BALKH, an ancient city of Afghanistan, in a province of same name, about 35 miles south of the Oxus, on a fertile plain 1800 feet above the sea. It was anciently named *Bactra*, and was long one of the most flourishing cities of the East, and the emporium of the trade between India, China, and Western Asia. The remains of the ancient city extend over many miles. The modern Balkh, merely a large village, has recently been quite superseded in importance by Mazar-i-Sherif, a place of some 25,000 inhabitants lying farther to the east and now the capital of the province. The province constitutes the most northerly portion of Afghanistan. In the vicinity of the Oxus there are great facilities for irrigation, and the soil is generally rich and productive. It formerly maintained a great population.

BALL, GAME OF. Ball-playing was practised by the ancients, and old and young amused themselves with it. It is mentioned by Homer in the *Odyssey*, the Phæacian damsels being represented as playing it to the sound of music. The Greeks and Romans had three or four kinds of balls. One was of leather, filled with air, and consequently similar to our football; another was a small ball, which three persons, placed in a triangle, struck towards each other. In a Roman villa a *sphaeristerium* (a place appropriated for playing ball) was often to be found, and no gymnasium was considered complete without an apartment devoted to this purpose. In the middle ages the sport continued very popular, and was often patronised by sovereigns and other eminent persons.

In England football and tennis are mentioned at an early date among favourite games. Another game was one in which a *mail* or mallet was used, hence the name *pell-mall* (*It. palla*, *L. pila*, a ball) for the game and the place where it was played. There are a number of very popular ball games, such as cricket, football, golf, &c. See separate articles.

BALLACHULISH, a village in Scotland, county of Argyre, situated near the entrance of Loch Leven, a branch of Loch Linnhe. At this village there is a quarry of excellent blue slate. Pop. (1891), 1045.

BALLAD, a narrative song, from the French *ballade*, Italian *ballata*, an old kind of song of a lyric nature. *Ballata* is derived from *ballare*, to dance, and that from Late Latin *ballare*, from Greek *ballo*, to dance. Though the name came from Italy, the species of poetry which we understand under the word *ballad* is by no means peculiarly of Italian or Romance origin, poems of this kind being produced by many nations, and being apparently the natural outcome of a certain condition of society, a certain intellectual and moral stage of development in the history of a people. The word *ballata* passed from the Italians to the French, and the Normans carried it to England, where it was applied to short metrical narratives, particularly to the most popular ones, which were taken in verse describing the deeds of heroes, the adventures of lovers, &c. All the Scandinavian nations anciently delighted in songs celebrating the deeds of heroes, or describing the passions and adventures of lovers; and the three great divisions or cycles of the Teutonic poetry of the middle ages—the stories of the Nibelungen, those of Charlemagne (particularly such as relate to his war against the Arabians, and the battle of Roncesvalles), and the tales of King Arthur's Round Table—were long made widely familiar to the people in the form of ballads. The true home of the English ballad—whatever the explanation of the fact may be—is the northern part of England (the North Country), and the southern part of Scotland. The earliest of the English ballads which have been preserved cannot be considered as antecedent to the thirteenth or fourteenth century; and few of them appeared before the fifteenth. How long many of them may have been current in the mouths of the people before that time is quite unknown. Of course, as regards historical ballads, though we may know nothing of their author, or when they arose, we are sure that their date is at least not earlier than that of the event or events they deal with. As a rule the genuine popular ballad poetry of a people is anonymous, and may have been handed down for centuries before being committed to writing, the different pieces being modified in various ways as they were transmitted to generation after generation. The first work to draw general attention to the ballad literature of England and Scotland was Bishop Percy's *Reliques of Ancient English Poetry*, published in 1765; 'consisting of old heroic ballads, songs, and other pieces of our earlier poets (chiefly of the lyric kind) together with some few of later date'. The foundation of the *Reliques* was a manuscript collection in a hand-writing belonging to the early part of the seventeenth century; and in this collection were included such old favourites as Chevy Chase; Adam Bell, Clym of the Clough, and William of Cloudelee; The Heir of Linn; The Child of Elie; ballads of Robin Hood, &c. The publication of Percy's work formed an epoch in the history of English literature, and had an important influence on the subsequent development of our poetry. No less famous and perhaps even more influential was Sir Walter Scott's great collection—*Minstrelsy of the Scottish Border*: consisting of Historical and Romantic ballads collected

in the Southern Counties of Scotland (1802-3, 3 vols.). A few years later (namely in 1806) appeared Robert Jamieson's *Popular Ballads and Songs . . . with Translations of Similar Pieces from the Ancient Danish Language*—a valuable collection, which, to use Sir Walter Scott's words, 'opened a new discovery respecting the original source of the Scottish ballads. Mr. Jamieson's extensive acquaintance with the Scandinavian literature enabled him to detect not only a general similarity between these and the Danish ballads preserved in the *Klempe Viser*, an early collection of heroic ballads in that language, but to demonstrate that, in many cases, the stories and songs were distinctly the same, a circumstance which no antiquary had hitherto so much as suspected.' Since that time the ballad literature of almost all countries possessed of such has received a great amount of attention, and the various collections that have been made have enabled investigators to study the whole subject on the comparative method; the result being that a surprising similarity of features has been discovered to exist in the ballads of countries as widely separated and apparently unconnected as Scotland, Sicily, Greece, and Russia. In this respect ballads quite resemble popular tales—'folk-tales', that is to say, such as those in the collection of the brothers Grimm, or those translated by Dasent from Asbjørnsen's Norwegian collection, in which class of stories, as is now well known, incidents that are essentially the same crop up over and over again, though they are more or less coloured by unessential details and surroundings. The attention drawn to the ballads of England and Scotland led not only to modern imitations of them in their own native country, but especially to such in Germany, where eminent writers such as Bürger, Goethe, Schiller, Uhland, and Heine successfully practised the writing of such pieces. Though a ballad as now usually understood is a moderately short narrative poem in a series of short stanzas, the word has been applied at different times to pieces of the most varied character, and we find Shakespeare, for instance, speaking of a 'woeful ballad', made by a lover 'to his mistress' eyebrow'. It is said that the majority of our old ballad tunes are dance tunes, so that we are thus reminded of the Italian origin of the word, though ballads and dancing have certainly been long enough dissociated in most countries. 'At the present time,' says a writer in Grove's Dictionary of Music, 'a ballad in music is generally understood to be a sentimental or romantic composition of a simple and unpretentious character, having two or more verses of poetry, but with the melody or tune complete in the first, and repeated for each succeeding verse.' From this is to be distinguished the *ballade* (a term recently adopted from the French), a short poem which, in its normal form, appears to consist of three stanzas of eight lines each, with a closing stanza or envoy of four lines, the rhymes throughout being not more than three. The works dealing with our ballads are now very numerous. See Sir Walter Scott's *Minstrelsy of the Scottish Border*; Motherwell's *Minstrelsy, Ancient and Modern*; Child's *English and Scottish Ballads*, Boston, 1857-58, 8 vols., now enlarged and improved edition recently published—a work in which different versions of the same ballad are often given, and the ballad lore of Europe has been investigated for purposes of comparison and illustration; Chappell's *Popular Music of the Olden Time*; Hales and Furnivall's reprint of the Percy MS., &c. A vast collection of old ballads has been published by the Ballad Society, founded in 1868.

BALLANTYNE, JAMES, a printer in Edinburgh,

whose name is intimately connected with the works of Sir Walter Scott, was a native of Kelso, being born there in 1772. Although not bred to the business of printer, he opened a printing-office in his native town, where, besides editing the *Kelso Mail* newspaper, he printed various works, which paved the way for his establishment in Edinburgh in 1802. The whole of the writings of Sir Walter Scott were printed by him, and to his taste the public is indebted for many emendations in the works of that illustrious minstrel and novelist, whose own inattention to not unimportant minutiae rendered such assistance highly necessary. For many years Mr. Ballantyne conducted the *Edinburgh Weekly Journal*, with a degree of good feeling and taste which the public did not fail to appreciate. His theatrical criticisms in particular were long admired as the very best of the day. He died four months after Sir Walter Scott, in January, 1833. In the printing business carried on by Ballantyne Sir Walter had a share, as also in the bookselling and publishing firm of John Ballantyne & Co., the other partners in this being James and his brother John (1774-1821). Scott's connection with these undertakings ultimately brought about his financial ruin.

BALLANTYNE, JAMES ROBERT, a distinguished orientalist, born at Kelso, in Roxburghshire, 18th Dec. 1813, was educated at the academy there, at the New Academy, Edinburgh, and at Edinburgh University. He then devoted himself for some years to the study of oriental languages at the East India Company's College at Haileybury. On his return to Edinburgh he was appointed teacher of these languages at the Naval and Military Academy there. In 1845 he was appointed by the court of directors of the East India Company to superintend, as principal, the new operations which had been commenced in the college of Benares, with a view to engrafting on Sanskrit education a knowledge of European literature and science. From 1856 he also filled the chair of moral philosophy. In 1861 he returned to Europe with the appointment of librarian to the India office, and died in London, 16th Feb. 1864. His works include translations of the whole of the original Sanskrit aphorisms of the Sankhya, and the greater part of those of the Nyaya school, as well as some explanatory expositions of these systems and of the Vedanta philosophy. In 1856 he published a work explanatory of his system, entitled *Synopsis of Science*, in Sanskrit and English, reconciled with the truth to be found in the Nyaya philosophy. Among his other numerous publications may be mentioned, *Christianity Contrasted with Hindu Philosophy* (1859); *First Lessons in Sanskrit Grammar* (1862).

BALLARAT, or BALLAARAT, an Australian town in the colony of Victoria, the chief centre of the gold-mining industry of the colony, and the place next in importance to Melbourne, from which it is distant w.n.w. 74 miles by rail. It owes its present importance and prosperity to its being the centre of one of the richest gold-yielding districts of the world. It consists of two distinct municipalities, Ballarat West and Ballarat East, which are separated by the Yarrowee Creek. The town is well lighted with gas, abundantly supplied with water, and contains many handsome public edifices, among which may be mentioned the city-hall, council chamber, two town-halls, a spacious hospital, an orphan asylum, a benevolent asylum, a lying-in hospital and refuge, public baths, a jail, mechanics' institute (with 22,500 volumes), a free library (with 15,000 volumes), a theatre and several other places of amusement, post-office, extensive railway premises, forty churches, the palaces of the Anglican and

Roman Catholic bishops, two colleges, four grammar and various other schools, a school of mines, many banks, numerous fine hotels, &c. There are several iron-foundries, breweries and distilleries, flour-mills, woollen mills, and other factories. Gold was first discovered at Ballarat in June, 1851, and the extraordinary richness of the field soon attracted hosts of miners. When the surface diggings became exhausted it was discovered that richer deposits of the precious metal lay at greater depths, and now there are mines as deep as some of the coal-pits of England. They are worked by steam-pumping and other machinery, and give employment to over 8000 men, about 1000 of whom are Chinese. One of the largest nuggets ever found anywhere was discovered here, and the price it fetched was £10,500. The surrounding district is also eminently suitable for farming and sheep-breeding. In addition to the line to Melbourne, this place has railway connection with Geelong, Ararat, Maryborough, Castlemaine, &c. Ballarat West has been erected into an episcopal city. Pop. in 1881, 38,489, 22,425 being in Ballarat West, and 16,044 in Ballarat East; total in 1901, 46,410.

BALLAST, any heavy material, of little or no value, deposited in ships which have not freight enough to sink them to their proper depth in the water. The heavier portion of a valuable cargo, such as iron, is sometimes called ballast. The proper ballasting of a vessel requires some attention. If too much heavy ballast, such as iron, lies near the keel, the centre of gravity will be too low, and the ship, though able to carry a press of sail, will roll violently and sail heavily; in technical language, she will be *stiff*. On the other hand, if the centre of gravity is too high the vessel will be *crank*, or liable to overset.

BALLENTYNE, or **BELLENDEN**, JOHN, a Scottish poet of the reign of James V., and the translator of Boece's Latin History, and of the first five books of Livy, into the vernacular language of his time, was a native of Lothian, and appears to have been born towards the close of the fifteenth century. He studied at the University of St. Andrews, and afterwards at the University of Paris, where he took the degree of Doctor of Divinity. He returned to Scotland during the minority of James V., and became attached to the establishment of that monarch as 'clerk of his comptis'. In 1530 and 1531 Ballentyne was employed, by command of the king, in translating Boece's History, which had been published at Paris in 1526. Ballentyne delivered a manuscript copy of his work to the king in the summer of 1533, and about the same time he appears to have been engaged in a translation of Livy. His translation of Boece was printed in 1536, by Thomas Davidson, and had become in later times almost unique, till a new edition was published in a remarkably elegant style in 1821, by Messrs. Tait, Edinburgh. At the same time appeared the translation of the first two books of Livy, which had never before been printed. The latter work seems to have been carried no further by the translator. Ballentyne seems to have lived happily in the sunshine of court favour during the reign of James V. The opposition which he afterwards presented to the Reformation brought him into such odium that he retired from his country in disgust, and died at Rome about the year 1560. The translations of Ballentyne are characterized by a striking felicity of language, and also by a freedom that shows his profound acquaintance with the learned language upon which he wrought. Many of the works of Ballentyne are lost—among others a tract on the Pythagoric letter, and a discourse upon Virtue and Pleasure. He also wrote many political pieces, the most of which are lost.

BALLET (from *bal*; from the French *baller*, and

the Italian *ballare*, to dance), in its widest sense the representation of a series of passionate actions and feelings, by means of gestures and dancing. According to this signification we comprehend, under ballets, even representations of mental emotions not connected with a regular train of action. In a more confined sense we call ballets musical pieces, the object of which is to represent, by mimic movements and dances, actions, characters, sentiments, passions, and feelings, in which several dancers perform together. According to the analogy of lyrical poetry, those which rather represent feelings may be called *lyrical ballets*; those which imitate actions, *dramatic ballets*. The lyrical and dramatic ballets, together, constitute the higher art of dancing, in opposition to the lower, the aim of which is only social pleasure. The dramatic ballets are divided into *historical*, the subject of which is a real event; the *mythological*, in which the subject is some fabulous action; and the *poetical*, which are founded on poetical fiction, to which belong also the *allegorical*, necessarily the most imperfect. A ballet is usually divided into several acts, each of which has several *entrées*. An *entrée*, in a ballet, consists of one or several quadrilles of dancers, who, by their steps, gestures, and attitudes, represent a certain part of the action. In criticizing a ballet we must consider, first, the choice of the subject, which must have unity of action or of passion, and must be capable of being represented in an intelligible manner by means of mimic movements and dancing; secondly, the plan and execution of the single parts, which must have a due proportion to each other; and, finally, the music and decorations, which must supply whatever dancing cannot bring before the eye. The ballet is an invention of modern times. Baltazarini, director of music to Catharine de' Medici, probably gave its form to the regular ballet, though pantomimic dances were not unknown to the ancients. (See *MIMIC* and *PANTOMIMIC*.) The ballet owes much to the French, and particularly to Noverre (from 1749 onwards). The dances which are frequently introduced into operas seldom deserve the name ballet, as they usually do not represent any action, but are destined only to give the dancers an opportunity of showing their skill, and the modern ballet in general, from an artistic point of view, is a very low-class entertainment.

BALLINA, a market town and river-port, Ireland, county Mayo, on both banks of the Moy, the town itself being on the left bank, and the suburb Ardarae, with which it is connected by two bridges, being on the right bank, about 5 miles above its mouth in Killala Bay. The general appearance of the town is rather pleasing; one excellent street runs parallel to the river. Most of the other streets lie at right angles, and consist chiefly of poor cabins and cottages, intermingled with a few better buildings. The town contains an ancient parish church, a handsome Roman Catholic cathedral, and a court-house. The retail and provision trade of Ballina is considerable; it has also a little coasting and foreign trade. The town is a great resort of anglers in summer, the river and lake fishing being excellent. Pop. (1891), 4846.

BALLINASLOE, a market town, Ireland, 15 miles S.W. of Athlone, on both sides of the Suak, which here separates the counties of Galway and Roscommon. It is well built, and has an elegant Episcopal church with an octagonal spire; a Roman Catholic, a Presbyterian, and a Methodist church; a lunatic asylum, a convent, &c. It communicates by canal both with the Shannon and with Dublin, and is thus a great thoroughfare both for goods and passengers, but it is best known by its five-days' cattle fair, beginning on first Tuesday in October, the most important in Ireland. Pop. (1891), 4642.

BALLISTÆ. See **BALISTÆ**.

BALLISTIC PENDULUM, an apparatus for ascertaining the velocity of military projectiles and consequently the strength of fired gunpowder. A piece of ordnance discharges a ball against bags of sand supported in a strong case or frame suspended so as to swing like a pendulum. The arc through which the projectile causes this to swing is shown by an index, and the amount of vibration forms a measure of the force or velocity of the ball.

BALLOON. See **ÆRONAUTICS**.

BALLOON-FISH (*Tetradodon lineatus*), a curious tropical fish of the order Plectognathi, having the power of inflating itself so as to resemble a ball.

BALLOT, Voting by, signifies voting by means of little balls (called by the French *ballottes*), usually of different colours, which are put into a box in such a manner as to enable the voter, if he chooses, to conceal for whom or for what he gives his suffrage. The method is adopted by most clubs in the election of their members—a white ball indicating assent; a black ball dissent. Hence when an applicant is rejected he is said to be *blackballed*. The term voting by ballot is also applied in a general way to any method of secret voting, as for instance when a person gives his vote by means of a ticket or paper bearing the name of the candidate whom he wishes to support. The ballot, as a political institution, is known from early times, having been made use of in ancient Greece and Rome. At Athens, when the measure called ostracism was resorted to, the votes were given by means of shells, on which the voters wrote the name of the citizen whom they wished banished. At Rome the ballot was introduced in the election of magistrates in 139 B.C., and subsequently in trials and legislation. In the republic of Venice a system of voting by ballot prevailed for many centuries. In the United States it has long been used; in France it has been in operation in elections since 1817; and in several of the Australian colonies since 1855. In Great Britain the Education Act of 1870 introduced it in the election of school boards, and in parliamentary and municipal elections it was introduced in 1872 by the act 35 and 36 Vict. cap. xxxiii. It was only to remain in force, however, for eight years (till 31st December, 1880), but of course it has been continued. This act does away with public nominations in the case of parliamentary elections, the candidates being now nominated by written papers delivered to the returning officer, and signed by the proposer and seconder, and eight other electors. When there are more candidates than vacancies, and a poll is required, the votes are to be given by means of voting papers, each of which contains a list of the candidates. These papers are obtained from the presiding officers at the polling stations. Each elector receives one and no more, and before they are given out they are stamped with the official mark. On receiving his paper the voter is to retire to a compartment in the polling station, where he is secretly to mark his vote upon the face of the paper by putting a × opposite the name or names of the candidates he votes for. He is then to fold up the paper so as to conceal his vote, and having shown to the presiding officer the official mark on the back, he is to place the paper in the ballot-box in presence of this officer. On the close of the poll the ballot-boxes are sealed up and taken charge of by the returning officer, who must count the votes as soon as practicable, and then give public notice of the names of the candidates elected, and of the number of votes recorded for each.

BALLYCASTLE, a market town of Ireland on the north coast of Antrim, on Ballycastle Bay, with some fine scenery in the neighbourhood, as also

coal and iron mines. Fishing is actively carried on. Pop. (1891), 1481.

BALLYMENA, a market town of Ireland, county Antrim, 22 miles N.W. by r. from Belfast, on a gentle acclivity. It is well and substantially built in the old-fashioned style, and contains an elegant town-house, an Episcopalian and various other churches, National and other schools. It has a considerable trade in linens and linen yarns, the manufacture of which is carried on to a great extent. Pop. in 1871, 7981; in 1881, 8883; in 1891, 8855; in 1901, 10,888.

BALLYMONEY, a market town of Ireland, in the north-west of county Antrim, with linen manufactures, brewing and distilling, and a trade in flax, butter, &c. Pop. (1881), 2975.

BALLYSHANNON, a town and seaport of Ireland, in the county of and 11 miles S.W. Donegal, on the Erne, about 1 mile from the S.E. shore of Donegal Bay. The river flows through the town and is crossed by a bridge of fourteen arches. It forms a fine waterfall here. Pop. in 1891, 2471.

BALM, a name applied to several plants, but more distinctively to *Melissa officinalis*, a well-known perennial herb of the order Labiate. It is a native of southern Europe and western Asia and was long ago introduced into English gardens. The plant is in some repute for its medicinal virtues, and the stem and leaves possess slightly stimulant and tonic properties. They yield an essential oil of a yellowish colour and fragrant smell.—Bastard balm is *Melittis meliophyllum*, a handsome labiate plant with large and often richly coloured flowers, growing in woods and hedges of the south and south-west of England, and occurring throughout central and southern Europe. It is highly fragrant.

BALMERINO (anciently *Balmorinach*), a village and parish of Scotland, in Fifeshire, on the Firth of Tay, 3½ miles south-west of Dundee. The place was formerly of more importance than it now is, and had an extensive Cistercian abbey of which scanty remains may still be seen. It was burned by the English in 1548, and was sacked by a rabble of zealous reformers in 1559. Balmerino gave the title of baron to a family of Elphinstones, and the last holder was beheaded for his share in the rebellion of 1745.

BALM OF GILEAD, the dried juice of a low tree or shrub (*Balsamodendron Gileadense*, natural order Amyridaceæ), which grows in Syria, Arabia, and elsewhere. It is also obtained from the *B. Opobalsamum*. By the inhabitants of Syria and Egypt this balsam, as appears from the Scriptures, was anciently in great esteem. The Ishmaelitic merchants who were the purchasers of Joseph are said to have been travelling from Gilead, on the eastern side of Canaan, to Egypt, and to have had their camels laden with 'spiciery, balm, and myrrh'. It was then, and is still, considered a most valuable medicine, and is also used as a fragrant unguent and cosmetic. The virtues, however, which have been ascribed to it exceed all rational bounds of credibility. It is obtained by making incisions in the bark of the tree at a time when its juice is in strong circulation. This as it oozes out is received into small earthen bottles; and every day's produce is gathered and poured into a larger bottle, which is closely corked. When the juice first issues from the wound it is of a light yellow colour, and a somewhat turbid appearance; but as it settles it becomes clear, and has the colour of honey. Its smell is fragrant and pungent, not much unlike that of volatile salts. But if the bottle be left uncorked it soon loses this quality. Its taste is bitter, acrid, and astringent. The quantity of balsam yielded by one tree is very small. Though this balsam is used as a cosmetic the stimulating properties upon the skin are such that

the face of a person unaccustomed to use it becomes red and swollen after its application, and continues so for some days. The Turks also take it in small quantities in water to fortify the stomach and excite the animal faculties.

BALMORAL CASTLE, the Highland residence of her majesty Queen Victoria, beautifully situated on the s. bank of the Dee, in the county of, and 48 miles w. of Aberdeen, and 11 miles E.N.E. of the Castleton of Breemar. The site on which it stands is almost completely hemmed in by majestic mountains, and the views from the castle of the varied scenery distinguishing these are of the most magnificent description. Balmoral was originally a shooting-lodge of the Earl of Fife, but was leased to, and greatly enlarged by a brother of the Earl of Aberdeen, and in 1848 the reversion of the lease was purchased by Prince Albert. The accommodation furnished by the old building was very inadequate, and accordingly, the property having been purchased in 1852, the present mansion was erected shortly afterwards. It underwent some enlargement in 1888. It is built of gray granite, in the Scottish baronial style, and has a massive and imposing appearance in the distance. It consists of two blocks connected by wings, and has a massive tower 80 feet high, with a turret of 20 feet in height. The estate, which was the queen's private property, comprises some 40,000 acres, three-fourths being deer-forest.

BALNAVES, HENRY, of Halhill, a Scottish reformer, and also a prose writer of some eminence, was born at Kirkcaldy, Fifeshire, probably about 1513. After an academical course at St. Andrews he travelled to the Continent, and hearing of a free school in Cologne procured admission to it, and received a liberal education, together with instruction in Protestant principles. Returning to his native country he applied himself to the study of law, and acted for some time as a procurator at St. Andrews. In the year 1538 he was appointed by James V. a senator of the College of Justice, a court only instituted five years before. Notwithstanding the jealousy of the clergy, who hated him on account of his religious sentiments, he was employed on important embassies by James V., and subsequently by the governor Arran, during the first part of whose regency he acted as secretary of state. Having at length made an open profession of the Protestant religion, he was, at the instigation of Arran's brother, the abbot of Paisley, dismissed from that situation. He entered into the interests of the English party against the governor, and with the Earl of Rothes and Lord Gray, was thrown into Blackness Castle (November, 1543), where he probably remained till relieved next year on the appearance of the English fleet in the Firth of Forth. Accused of being privy to the conspiracy formed against the life of Cardinal Beaton, he shared in the fate of the conspirators. He was conveyed to the castle of Rouen in France, and there committed to close confinement. Here he employed himself in composing a treatise on Justification, which was published at Edinburgh in 1584, under the title of *The Confession of Faith*, containing how the troubled man should seek refuge at his God, thereto led by Faith, &c. After his return from banishment Balnaves took a conspicuous part on the side of the reformers in the religious struggle. In 1563 he was reappointed to the bench, and also nominated as one of the commissioners for revising *The Book of Discipline*. He acted some years later as counsellor in the inquiry by English and Scottish commissioners into the alleged guilt of Queen Mary. He died in 1579.

BALOOCHISTAN, another spelling of Beloochistan (which see).

BALSA, a nautical term of Spanish origin, applied to a contrivance used chiefly on the coasts of South America for landing passengers and goods through a heavy surf. It is formed of seal-skins sewed up into two large bags from 7 to 9 feet long, and made perfectly air-tight by being smeared with a bituminous substance. The bags, inflated with air by means of flexible tubes attached to them, are fastened together at one end, which forms the prow of the vessel, and kept about 4 feet apart at the other end by means of a small plank; the intermediate space is formed into a raft by means of small sticks covered with matting. This frail raft is buoyant enough to carry the conductor and three other persons, or an equal weight of goods, and lands in safety through a surf into which no European boat could venture without the greatest danger.

BALSAM. The term balsam was formerly applied to any strong-scented natural vegetable resin, of about the fluidity of treacle, inflammable, not miscible with water without addition, and supposed to be possessed of many medical virtues. All the turpentine, the Peruvian balsam, copaiba, &c., are examples of natural balsams. Many medicines, also, compounded of various resins or oils, have obtained the name of balsams; as Locatelli balsam, &c. The term is now used to denote two classes of substances: the *oleo-resins*, mixtures of volatile oils with resins, of which Canada balsam, balm of Gilead, and the turpentine are examples; and balsams containing cinnamon or benzoic acid, besides the oil and resin. Of the latter, the Peru and Tolu balsams are examples. They are odorous and pungent; some are fluid, others solid. By distilling them alone, and also with water, a variety of products is obtained. Some are employed in pharmacy. The balsam of Peru is derived from the tree *Myrospermum Pereira* (or *Toluifera Pereira*), and that of Tolu from *M. toluifera* (or *T. Balsamum*), both these trees belonging to the natural order Leguminosæ. Copaiba balsam is obtained from various species of the leguminous genus *Copaifera*.—The species of *Impatiens*, a genus of *Balsaminaceæ*, are also known as balsam, especially *I. balsamina*, a much-cultivated plant. *I. noli-me-tangere*, Yellow Balsam, or Touch-me-not, is a hardy annual found apparently wild in many parts of Britain. It derives its botanical names and the second of its popular names from the fact that its capsules burst when touched and scatter their seeds.

BALTIC SEA, a large gulf or inland sea connected with the North Sea by way of the Skager-rack and Kattegat. It washes the coasts of Denmark, Germany, Courland, Livonia, and other parts of Russia, and of Sweden; extends to 65° 30' N. lat., is nearly 900 miles long, from 40 to 200 broad, and its superficial extent, together with the contents of the Gulfs of Bothnia and Finland, amounts to 160,000 square miles. Its small breadth, its depth, amounting on an average to from 40 to 50 fathoms, but in many places hardly so much, its shallowness towards the Prussian shores, and the rugged nature of the Swedish coasts, but above all, the sudden and frequent changes of the wind, accompanied by violent storms, render this sea dangerous for navigators, although its waves are less powerful than those of the North Sea. A chain of islands separates the southern part from the northern, or the Gulf of Bothnia. In the north-east the Gulf of Finland stretches eastwards, and separates the province of Finland from Esthonia. A third gulf is that of Riga or Livonia. The Kurisches Haff and the Frisches Haff are inlets or lagoons on the Prussian coast. The water of the Baltic is colder and clearer than that of the ocean: it contains a smaller proportion of salt, and the ice obstructs the navigation three or four months in the year. The ebb and flow of the tide

are inconsiderable, as is the case in other inland seas, the difference between high-water and low-water mark being only about a foot; yet the water rises and falls from time to time, probably owing to the varying rainfall and evaporation. In stormy weather amber is often found on the coasts of Prussia and Courland, which the waves wash upon the shore. Many streams empty themselves into the Baltic; among them are the Neva, Dwina, Oder, Vistula, Niemen, and a number of Swedish rivers. Between the Kattegat and Baltic are the large Danish islands Zealand and Funen; others in the sea itself are Samsoe, Moen, Bornholm, Langeland, Laaland, which belong to Denmark; the Swedish Islands—Gottland and Oeland, (besides Hveen in the Sound, with the ruins of Oranienburg, the observatory built by Tycho Brahe); Rügen, belonging to Prussia; the Aland Islands at the entrance of the Gulf of Bothnia, and Dagoo, together with Oesel, on the coast of Livonia, all of which belong to Russia. The Sound, the Great and the Little Belt lead from the Kattegat into the Baltic. The Baltic and North Sea are now connected by the great ship canal constructed between the Elbe, near its mouth, and Kiel Bay, and opened in 1895. The canal is a work of the German government, and is intended for the use of war-vessels as well as trading ships, many of which, bound to or from Baltic ports, will be able to effect a great saving by means of this water-way. The chief seaports of the Baltic are St. Petersburg, Kronstadt, Riga, Reval, Narva, Libau, in Russia; Stockholm, Gefle, Karlskrona, in Sweden; Memel, Königsberg, Danzig, Stettin, Lübeck, and Kiel, in Germany; Copenhagen, in Denmark.

BALTIMORE, a city and seaport in Baltimore county, Maryland, U. States, on the N. side of the Patuxent, 14 miles above its entrance into Chesapeake Bay; 40 N.E. of Washington, 97 S.W. Philadelphia. Pop. in 1890, 484,439; in 1900 508,957.—Baltimore has had a remarkably rapid growth, though not so much so as some American cities. It was first laid out as a town in 1729; and in 1766 it contained only about fifty houses. It was erected into a city in 1797, and is now the seventh in size in the United States. It is a place of great wealth, and is not only a centre of commerce, but is also an important manufacturing city. Among the principal articles of trade are tobacco, grain and flour, cotton, chemicals and manures, cattle, lard, provisions, fruit, &c. In 1890 its industrial works employed over 83,000 hands, many being employed in packing oysters and fruits, in foundries and machine-shops. In clothing factories, and in numerous other works. The vicinity affords great water privileges, and flour-mills, cotton manufactories, and other works are driven by water. Ship-building is one of the industries of the city. The exports have greatly increased in recent years, and now average about £22,000,000 per annum in value; the imports have not shown a similar increase, and their present average is about £2,750,000 per annum. Grain and provisions are the chief exports to Britain. Baltimore is built around an inlet which affords a spacious, secure, and commodious harbour. The harbour is divided into an outer and an inner. The inner, or 'basin', is suitable only for vessels of the smaller class; the outer, or 'harbour', is deeper, and capable of accommodating the large sea-going vessels. A special entrance-channel has been formed by dredging, which is 27 feet deep at ordinary low water, and 28½ at high water. The mouth of the harbour is a narrow strait commanded by Fort M'Henry, which secures the city against a naval force. The situation of a part of the town is low, and it was formerly accounted unhealthy; but the various improvements which have been made, particularly the filling up of low and marshy

grounds, have rendered it healthy. It is abundantly supplied with excellent water, the aqueducts and reservoirs being capable of supplying 200,000,000 gallons daily. Among the public buildings may be named the new city-hall built of white marble; the exchange, with an Ionic portico of white marble pillars; the Maryland Institute; the custom-house, with a dome 115 feet high; the court-house; the Oddfellows' hall; the masonic temple of white marble; the Bay View Asylum; Spring Grove Asylum; Maryland Institution for the Blind; the Peabody Institute, a marble building containing a free library, art gallery, &c.; the Johns Hopkins hospital, established for the indigent sick of the city; and the Roman Catholic cathedral. The Washington monument, a lofty structure of white marble, with a statue of Washington on the top, is situated on an elevation just above the compact part of the city. Another monument is the Battle Monument, built to commemorate the repulse of an attack by the British in 1814. The city is generally well built, mostly of brick, but marble and granite are also extensively employed; the streets are well paved, and many of them are spacious. The principal street, called Baltimore Street, is several miles long, and about 80 feet wide, and runs nearly N. and W. The principal street at right angles to this is Charles Street. There are numerous public squares, and several parks, of which Druid Hill Park, just outside the city, on the north-west, contains 700 acres, while Clifton Park on the north-east is still larger. The educational institutions include Loyola College or University, a Catholic institution; Maryland University, a medical school, one of the oldest in the States, and one which takes high rank; Johns Hopkins University, one of the foremost institutions of its kind in America, opened in 1876, and named after its founder, by whom it was munificently endowed; the Maryland Academy of Science; and the Law School of Maryland. The free library in the Peabody Institute embraces about 80,000 vols. There is also a free library, called the Pratt Free Library, likewise established by private munificence.

BALTIMORE BIRD (*Icterus Baltimore*; *Oriolus Baltimore*), a North American bird, called also *hanging-nest*, *golden robin*, *fire-bird*, *hanging-nest*. The Baltimore bird is migratory, arriving in Pennsylvania about the beginning of May, and departing towards the end of August or beginning of September. It is most generally known by the name of *Baltimore bird*, a name given, according to Catesby, from its black and orange plumage, these colours being those of Calvert, Lord Baltimore, original proprietor of the province of Maryland.—The bird is 7 inches long, and has a nearly straight, strong, black bill, tapering to a point. The head, throat, and upper part of the back and wings are black; the inferior part of the back, rump, and whole of the body beneath are of a brilliant orange hue. The tail is slightly forked; the legs are of a lead colour, and the irides hazel. The colours of the female are far less brilliant than those of the male. The nest of the Baltimore bird is formed by fastening strong strings of hemp or flax round two forked twigs, corresponding to the intended width of the nest, on the high-bending extremities of apple, willow, or tulip tree branches, near farmhouses. With similar materials, together with loose fibres, a strong sort of cloth is interwoven, resembling raw felt, forming a pouch 6 or 7 inches deep. This is well lined with soft substances, which are worked into the outward netting, and finally with a layer of horse-hair, the whole being protected from sun and rain by the overhanging leaves. The nests, however, are not uniformly of the same shape, and some are more perfect than others. While making their nests these birds will carry off

any thread or string left within their reach; they will even attempt to pull off the strings with which grafts are secured. All such materials are interwoven in the fabric with great ingenuity, and the strongest and best materials are uniformly found in parts by which the whole nest is supported. The Baltimore bird feeds on insects, caterpillars, beetles, &c. His song is a clear, mellow whistle, repeated at short intervals; when alarmed, a rapid chirping is uttered, but always followed by his peculiar mellow notes. The species inhabits North America from Canada to Mexico, and is found even as far as Brazil.

BALZAC, HONORÉ DE, a celebrated French novelist, was born at Tours in 1799. His father had, under the old regime, been secretary to the grand council in the reign of Louis XV. Young Balzac was educated at the College of Vendôme, and afterwards at a school kept by a M. Lepitre. He was subsequently placed in a notary's office in Paris; but the bent of his genius soon showed itself, and he began to contribute articles to the journals and write romances. Before completing his twenty-fourth year he had published, under various *pseudonyms*, *Les Deux Héctor*, *Le Centenaire*, *Le Vicaire des Ardennes*, *Charles Pointel*, *L'Héritière de Bérangère*, *Le Tartare ou le Retour de l'Exilé*, and *Clotilde de Lusignan*. Various others followed, but the success attending all was very indifferent, and it was not till 1829, by the publication of *Le Dernier Chouan*, a tale of La Vendée, and the first novel to which Balzac appended his name, that the attention of the public was directed to the extraordinary genius of the author. A still greater popularity attended his *Physiologie de Mariage*, a work full of piquant and caustic observations on human nature. A Titanic work was then projected by him, which, under the title of *La Comédie Humaine*, should embrace a series of compositions corresponding to its title, and portraying the different peculiarities and follies of human nature. The execution of this scheme was zealously and elaborately proceeded with, and extending over twenty years was only brought to a stop by death. It includes the best of Balzac's works, among which may be mentioned more especially his *Scènes de la Vie de Province*; *Scènes de la Vie Parisienne*; *Le Père Goriot*; *Eugénie Grandet*; and *Le Médecin de Campagne*. The distinguishing characteristics of these are a wondrous exuberance of imagination and depth of knowledge of the human heart, whose secret workings and influences are traced and dissected by a master hand. The author's powers of description, however, not unfrequently betray him into a tendency to exaggeration and tiresome minuteness of detail, while propriety is sometimes outraged by delineations of subjects which ought not to have been obtruded on the view. That Balzac should be so little known in England is somewhat remarkable, though a reason may be found in the defects above enumerated.

Balzac's career was marked by many eccentricities, among which his relations with his publisher and co-adjutor, M. Barbier, are not the least remarkable. In 1835 he became acquainted with the Countess Eveline de Hanska, a Polish lady, whom he afterwards married on her becoming a widow. He survived this union only for a few months, and died of hypertrophy of the heart in August, 1850.

BALZAC, JEAN LOUIS GUY DE, a member of the French Academy, born at Angoulême in 1594, lived in Rome as agent of the Cardinal de Lavalette, after two years established himself in Paris, and by his talents attracted the favourable notice of the Cardinal Richelieu, who conferred upon him a salary of 2000 livres, with the title of a councillor of state. He was considered as one of the greatest scholars

and most eloquent men of his age in France; yet his numerous writings found severe critics. Among these Goulu, general of the Feuillants (a monastic order under the rule of St. Bernard), pushed his criticisms even to insult and abuse. This induced Balzac to leave Paris. He died in Angoulême in 1654 and the sixtieth year of his age. Aiming at dignity of style, he fell into bombast, affectation, and exaggeration, so that his works have gradually lost their reputation as taste has improved. Nevertheless, we must do justice to the harmony of his periods, and acknowledge that he has done much towards the improvement of French prose. He had studied the ancients, and his Latin poems, although without remarkable poetical merit, are pure, and free from the faults of his French writings. The most perfect of his works is without doubt a treatise upon Latin verse. The assertion of Voltaire and Laharpe that he occupied himself more with words than with ideas is too severe. A complete edition of his works appeared at Paris in 1765, in two vols. folio.

BAMBARRA, a once powerful kingdom of Africa, now forming part of the French Soudan. It is traversed from w. to e. by the Niger, and is generally very fertile. The inhabitants are a mixture of negroes and other races; the Bambara proper are of Mandingo race. They practise a number of handicrafts. Among the towns are Sego, the capital, Jenne, and Sansanding.

BAMBERG, a town of Bavaria, in Upper Franconia, on the navigable Regnitz (which here divides into two), 8 miles above its junction with the Main, partly on a plain, partly on hills, amid vineyards and gardens. Its chief edifice is the cathedral (R. Catholic), built in the 12th century, and forming one of the finest examples of the transition from the Romanesque to the Gothic style, with four towers, a noteworthy portal, and interesting sculptures and monuments. Other buildings include the old palace or residence; another palace, formerly occupied by King Otto of Greece; the former castle of the prince-bishops of Bamberg, &c. The educational institutions include a college or lyceum, an old and a new gymnasium, a Roman Catholic seminary, an observatory, &c. There is a library containing 800,000 vols., with valuable MSS. and early printed books. There are manufactures of cottons and woollens, besides other industries, such as market-gardening and seed-growing, brewing, &c. Pop. in 1900, 41,826.

BAMBOO. The bamboo (*Bambusa arundinacea*) is a gigantic grass, with a hollow, straight, and shining stem, and sometimes grows to the length of 40 feet and upwards; has knots at the distance of 10 or 12 inches from each other, with thick, rough, and hairy sheaths, alternate branches, and small, entire, and spear-shaped leaves. There is scarcely any plant so common in hot climates as this, and few are more extensively useful. It occurs within the tropical regions, both of the eastern and western hemispheres, throughout the East Indies and the greater part of China, in the West Indies and America. In temperate climates it can only be cultivated in a hot-house, and its growth is so rapid, even there, that a strong shoot has been known to spring from the ground and attain the height of 20 feet in six weeks. The inhabitants of many parts of Asia build their houses almost wholly of bamboo, and make all sorts of furniture with it, in a very ingenious manner. They likewise form with it several kinds of utensils for their kitchens and tables; and from two pieces of bamboo rubbed hard together they produce fire. The masts of boats, boxes, baskets, and innumerable other articles are made of bamboo. After having been bruised, steeped in water, and formed into a pulp, paper is manufac-

tured from the sheaths and leaves. The stems are frequently bured, and used as pipes for conveying water; and the strongest serve to make the sticks or poles with which the slaves or servants carry those litters, so common in the East, called *palangins*. The stems of the bamboo serve as the usual defence for gardens and other inclosures; and the leaves are generally put round the tea exported from China to Europe and America. Some of the Malays preserve the small and tender shoots in vinegar and pepper to be eaten with their food. Many of the walking-canes used in Europe and the United States are formed of young bamboo shoots. The Chinese make a kind of framework of bamboo, by which they are enabled to float in water; and the Chinese merchants, when going on a voyage, always provide themselves with this simple apparatus to save their lives in case of shipwreck. It is formed by placing four bamboos horizontally across each other, so as to leave a square place in the middle for the body, and when used, is slipped over the head and secured by being tied to the waist.

BAMBOUK, a region in West Africa, in the French colony of Senegal, between the Falmé and Senegal rivers. The country is situated between 12° 30' and 14° 30' N. lat.; lon. 10° 30' to 12° 15' W.; and is estimated to be about 140 miles in length, by 80 to 100 in breadth. Besides the Senegal, its tributaries the Falmé and the Bafing (or Upper Senegal) form its natural boundaries. A considerable part of it is somewhat rugged, though not very elevated, the highest points seldom exceeding 600 feet. The valleys and plains are remarkably fertile. The baobab, calabash, tamarind, with a variety of acacias and palms, reach the utmost limit of their fruitfulness; maize, millet, cotton, and a multitude of leguminous plants, grow almost without culture, and rice is produced in the lowlands, which are subject to inundation. Its unhealthiness, however, makes it almost uninhabitable by Europeans. The animals comprise lions and elephants, wild cattle, crocodiles, &c. Gold is found in abundance. It is carelessly worked, and is given to traders in exchange for salt, an article in great demand, and various other goods. Bambouk is more sparsely inhabited than formerly. The natives are Mandingoes, and form a considerable number of communities or confederations more or less hostile to each other. The country has latterly been fully explored by the French, who are developing its resources, and have constructed a railway along the Senegal from Kayes to Bafoulabé. In the fifteenth century, the Portuguese, allured by the fame of its gold, invaded Bambouk, but ultimately perished almost to a man, partly through intestine dissension and debauchery, and partly by the weapons of the natives.

BAMPTON LECTURES, the name given to a course of lectures established by John Bampton, canon of Salisbury, who bequeathed certain property to the University of Oxford for the endowment of eight divinity lectures to be annually delivered. The subjects prescribed are, the Confirmation of the Christian Faith, and the Confutation of all Heresies and Schisms; the Divine Authority of the Scriptures; the Authority of the Primitive Fathers in matters of Christian Faith and Practice; the Divinity of Christ; the Divinity of the Holy Ghost; the Apostles' and Nicene Creeds. The lecturer must have taken the degree of M.A. at Oxford or Cambridge. The first course of lectures was delivered in 1780, and they have been delivered every year since, with the exceptions of 1884, 1885, and 1841. Some of the most celebrated divines of the Church of England are to be found among the Bampton lecturers. Reference is here made more especially to the lectures delivered

by Dr. White in 1784, by Dr. Mant in 1812, by Reginald Heber in 1815, Whately in 1822, Milman in 1827, Dr. Hampden in 1832, Dean Mansel in 1858, and Canon Liddon in 1866. A similar course of lectures, the Hulsean, is delivered at Cambridge.

BAN, in political law, is equivalent to excommunication in ecclesiastical. The Emperor of Germany had the right to declare a member of the empire under the ban, and to dispose of his feud. The ban, like the excommunication, forbids every one to have intercourse with the person proscribed, or to give him food or shelter. Very often, however, the sentence was repealed, and the party restored to all his rights and privileges.—*Ban*, in military affairs, is an order given by beating the drum or sounding the trumpet, requiring the strict observance of discipline, or announcing the appointment of an officer, &c.

BAN (*banus*). This name was formerly given to the governors of Dalmatia, Slavonia, Croatia, placed at the head of civil and military affairs in these countries. *Ban* signifies in the Slavonian tongue a master. A province over which a ban is placed is called *banat*. The only ban now existing is that of Croatia.

BANANA. The banana is a valuable plant (*Musa sapientum*) which grows in the West Indies and other tropical countries, and has leaves about 6 feet in length and a foot broad in the middle, and fruit 4 or 5 inches long, and about the shape of the cucumber. The banana is an herbaceous plant, of which the stalk perishes as soon as it has matured the fruit. It closely resembles the plantain (*Musa paradisiaca*), of which it is sometimes considered only a variety. The banana yields a shorter and rounder fruit than the plantain; the stem is also different, being spotted with purple, while that of the plantain is wholly green. The fruit is less luscious than that of the plantain, but it is more agreeable. The banana is not confined to any particular country of the torrid zone. It, as well as the plantain, may be cultivated indifferently in Asia, Africa, America, or the Atlantic or Pacific isles, wherever the mean heat of the year exceeds 75° Fahrenheit; and its cultivation in the climates suited for it is of the greatest importance. Its produce is enormous, and for an immense portion of the human race it is what wheat, barley, and rye are to the inhabitants of Europe, Western Asia, and North America. The banana is propagated by suckers, and its cultivation in this way, even by the most uncivilized tribes, is universal. It is not known in a wild state. Eight or nine months after the sucker has been planted the banana begins to form its clusters, and the fruit may be collected by the tenth or eleventh month. The only further care needed by the plants is to cut the stalks laden with ripe fruit, and dig round the roots of the plant once or twice a year. The fruit is a very sugary substance, and in warm climates affords a suitable nourishment. Those grown in European hot-houses have an insipid taste. The ripe fruit is preserved by being dried in the sun. Weight for weight the banana is inferior in nutriment to the potato, but it is much more productive than any other plant grown for food, and a much greater number of persons can be subsisted in a given space of ground with the banana than on an equal space in Europe with wheat. It has been supposed that the facility with which the banana is produced has been adverse to the progress of civilization in the countries where it is grown. But nature has probably not been mistaken in her beneficence in giving to man an easy means of subsistence in regions so adverse to protracted exertion.

BANAT a Hungarian word, formerly signifying any district governed by a ban. After the peace of Passarowitz the only district that retained the designation

nation was the Temesvar Banat, bounded on the north by the Maros, on the west by the Theiss, on the south by the Danube, and on the east by the spurs of the Carpathians. Its area was about 10,800 square miles. It is now incorporated with Hungary.

BANBRIDGE, a market town of Ireland, in county Down, 22 miles s.w. of Belfast, on the Ban. It has an Episcopal church in the Gothic style, and several other churches. The principal manufacture is that of linen, which is carried on to a great extent here. Pop. in 1891, 4901; in 1901, 3005.

BANBURY, a municipal borough and market town of England in Oxfordshire, 69 miles n.w. from London. It was a parl. borough till 1885 and now gives name to a parl. division. It is celebrated for its cakes and its ale. Agricultural implements are manufactured. Pop. in 1891, 12,768; in 1901, 12,967.

BANCA, **BANKA**, or **BANGKA**, an island of the Malay Archipelago, belonging to the Netherlands, between Sumatra and Borneo; area, 5000 square miles. Pop. in 1889, 77,837, of whom a considerable proportion are Chinese. It possesses several considerable bays, and is hilly. It is celebrated for its excellent tin, obtained in black alluvium in the s. end of the island, about 25 feet below the surface, and of which the annual yield is above 4000 tons. Banca likewise yields iron, copper, lead, timber, sago, nutmegs, benzoin, &c.

BANCROFT, **GEORGE**. See SUPPLEMENT.

BANCROFT, **RICHARD**, archbishop, born at Farnworth, in Lancashire, 1644, studied at Cambridge, entered the church, and rose rapidly during the reign of Elizabeth till he obtained the see of London in 1697. After her death James I. made him Archbishop of Canterbury on the death of Whitgift. He possessed good talents, and was distinguished as a controversialist, a preacher, and a politician. The greatest blot on his memory is the rigour with which he treated the Puritans. He died in 1610.

BANDA, a town of India, in the North-west Provinces, capital of a district of same name, on an undulating plain near the Ken river, 95 miles south-west of Allahabad. It is a straggling ill built place, but with clean streets, and contains a large number of mosques and temples. It was formerly an important cotton market. There are cantonments about a mile distant from the town. Pop. (1891), 23,071.

BANDAGE, a surgical wrapper applied to some part of the body. Bandages are employed for a variety of purposes. One of their chief uses is to secure dressings or splints. Another is to give support to a limb or to restrain its movements, or to exert pressure upon it so as to aid in restraining bleeding at some point; or a bandage may be used to promote healing, as in the case of ulcers, or to aid in the removal of swelling. In these latter cases the bandage must be applied with a considerable degree of tightness, and great care must be exercised that it be evenly put on, and that the tightness with which it is drawn does not give rise to disturbances of the circulation by undue and irregular pressure. Suppose, for instance, the arm is being bandaged from the hand well up over the upper arm. The arteries which carry the blood down the limb are for the most part deeply seated and well protected by muscles, so that they are practically unaffected by any ordinary degree of pressure on the surface. But many of the veins which carry the blood back to the heart up the limb run immediately under the skin, and will be pressed upon considerably by a bandage applied round the arm. If the bandage is made too tight at the elbow, say, the veins will be compressed and the blood will flow less easily along them at that point than it does lower down where the pressure is

less. The consequence will be that the blood will be hindered in passing up from the hand; and as blood is all the time being carried down to the hand in the arteries, which are unaffected, the veins in the forearm and hand will become swollen and gorged with blood. The pressure of blood in the veins will become so great that fluid will be pressed out of the finer vessels into the surrounding tissues, and the hand will become swollen, puffy, and dropsical, while much pain will be experienced. If the tight turns of the bandage are now loosened, the veins will again offer a free passage to the blood, and the swelling and pain will gradually subside. The proper method in such a case is not necessarily to bandage loosely but to bandage uniformly, beginning with the requisite degree of tightness at the very extremity of the limb, and continuing evenly and regularly upwards. A general rule in bandaging a limb then is: never let the bandage be tighter up the limb than it is at the extremity; apply it firmly and evenly at the extremity and carry it up uniformly. To this may be added as a second rule, that if a bandage requires to be tightly applied in the course of a limb it must be begun at the extremity. It is specially necessary to follow these rules when the bandage is applied to secure a splint, since it must be tight enough to keep the splint in accurate position, or to keep a pad firmly applied over a wound for the arrest of bleeding. Bandages usually consist of strips of unbleached or bleached calico, linen, flannel, muslin, crinoline, &c. Elastic bandages and india-rubber bandages are also in use for particular cases. The material should be torn into strips of the requisite breadth, and the bandages should have no hem or edging, as this would prevent them stretching equally in all directions. The strips should be rolled up for use into firm rollers, a roller bandage being usually 6 yards long though often more. They are of different breadths, most commonly $\frac{3}{4}$ or $1\frac{1}{2}$ inches. For the chest and abdomen the breadth should be $\frac{4}{5}$ inches; for the fingers three-quarters of an inch. The triangular bandage is of all others the one made use of for rendering temporary aid in cases of accident, and through the training afforded by ambulance associations is now familiar to almost everyone. The bandages supplied by these associations usually have stamped upon them illustrations of the various uses to which they may be put in securing splints and dressings, in applying pressure to prevent bleeding, in acting as slings to give support to injured arms, &c. The bandage is made of a square yard of linen or calico halved diagonally, each half having of course two sides 36 inches each in length with a base of fully 50 inches. When it is desired to exert very considerable pressure upon a part for a length of time, or when it is desired to keep a limb or a joint motionless for some time, this may be done without the use of splints by stiffening the bandage with starch or plaster of Paris.

BANDA ISLES, a group belonging to Holland, in the Indian Archipelago, south of Ceram, the largest, Great Banda, being 12 miles long by 2 broad, while Goenong Api is an active volcano nearly 8000 feet high. They have a rich soil admirably adapted for the cultivation of the nutmeg, which is their chief product, others being cocoa-nuts and sago. The islands are liable to earthquakes. Pop. about 8000.

BANDANA, the name applied to a species of cotton handkerchief, having a dark ground of Turkey-red, blue, or purple, variegated with simple patterns of white or bright yellow. These handkerchiefs were originally manufactured in the East Indies; but the beauty and durability of their

colours caused such a demand that the manufacture of them was established in Britain. The process is first to dye the cloth of a dark colour, commonly Turkey-red, which serves as a ground. The white spots constituting the pattern are afterwards produced by discharging the colour with a solution of chlorine. In order to confine the discharging fluid to the exact points to be operated upon, the pattern is cut out in leaden plates upon which the fluid will not act, and as many handkerchiefs or pieces of cloth as are to be operated upon are inclosed between pairs of these patterns, and subjected to enormous pressure, the discharging fluid being run in at the top and prevented by the pressure from spreading, so that the pattern is brought out clean on the spots subjected to the action of the fluid.

BANDA ORIENTAL. See URUGUAY.

BANDELLO, MATTEO, Italian novelist, born about 1480, studied at Rome and Naples, and applied himself almost exclusively to polite literature. He was, in his youth, a Dominican monk, and was intrusted with the education of the celebrated Lucrezia Gonzaga. After the battle of Pavia he was banished from Italy as a partisan of the French, and Henry II. of France gave him in 1550 the bishopric of Agen. He left the administration of his diocese to the Bishop of Grasse, and employed himself, at the advanced age of seventy, in the completion of his novels, of which he published three volumes in 1554; a fourth was published in 1578, after his death, which took place in 1561. He also published some poems. His novels are in the style of Boccaccio, and are characterized by even greater license.

BAND-FISH, the name for scanthopterygious fishes of the family Cepolidae and genus Cepola, the most familiar being *C. rubescens*, found in the Mediterranean and also on the British coasts. It is of a brilliant red colour, and hence is known in some places as the red-ribbon and the fire-flame. The body is compressed laterally and elongated, the length being from 15 to 20 inches. The scales are extremely small, the eyes large, the nose short, and the lower jaw often longer than the upper. The dorsal and anal fins are very long, and are continuous with the caudal or tail fin which is comparatively small and pointed. Sea-weed, small crustaceae, &c., are said to form the food of the fish, which is itself preyed upon by larger fishes.

BANDICOOT (*Peromyscus*), a genus of marsupial mammals found in Australia, where they occupy a situation analogous to that of the shrews and other insectivora of the Old World. They resemble the opossum and kangaroos, but differ from the former, especially in the number of their incisors—ten in the upper jaw, and six only in the lower; and from the latter in having their toes provided with broad powerful claws, which enable them both to scratch up the ground for roots, and to burrow with remarkable rapidity. Of the numerous species the best known is *P. nasutus*, or the long-nosed bandicoot, which has a head about 4 inches long, terminating in an attenuated snout, a body measuring 18 inches, covered with a coat of coarse bristly hair, a tail 6 inches, hind legs 6 inches, and fore legs only 3 inches. Both in colour and appearance it bears a great resemblance to the common rat, which it also imitates in the devastations it commits upon grain and other crops. Its pace more resembles that of hares and rabbits than the leaping movement of kangaroos.

BANDICOOT or **BANDICOOT RAT**, the name for a large species of rat inhabiting India, Ceylon, the Indo-Chinese peninsula, &c. This animal (*Mus giganteus*) is the largest species of rat known, reaching the length of about 2 feet or more (including the tail), and the weight of 2 or 3 pounds. Its

food is miscellaneous, but often consists of grass and roots, and it may do much damage in gardens. Its flesh is said to resemble young pork, and is a favourite food with the coolies of Ceylon. The name bandicoot is a corruption of the Telugu name *pandikotu*, which means literally pig-rat. According to Sir J. E. Tennent its nests in Ceylon are frequently found to contain considerable quantities of rice stored up against the dry season.

BANDINELLI, BACCO, Italian sculptor of note, was born at Florence in 1493, the son of a goldsmith. He learned his art under the sculptor Rustici, but modelled his style after that of Michael Angelo, whom he vainly attempted to rival and whom he hated with lifelong hatred. He was patronized by the Medici, and in honour of the presence of Leo X. in Florence he executed the model of a colossal statue of Hercules which was intended to surpass the David of Michael Angelo. Another work of his was an inferior copy of the Laocoon group for Francis I. He produced also a Hercules and Cacus (at Florence), a somewhat heavy work, 88 figures of apostles, prophets, and saints in the choir of the cathedral at Florence, a Bacchus, an Adam and Eve, &c. He died in 1560.

BANDIT, Italian, *bandito*, originally an exile, banished man, or outlaw; and hence, as persons outlawed frequently adopted the profession of brigand or highwayman, the word came to be synonymous with brigand. Of all European countries Italy has perhaps been most infested with banditti. They used to form a kind of society of themselves, subjected to strict laws, and living in open or secret war with the civil authorities. Peter the Calabrian, the most terrible among these robbers, in 1812 named himself, in imitation of the titles of Napoleon, 'emperor of the mountains'; 'king of the woods', 'protector of the conscribed', and 'mediator of the highways from Florence to Naples'. The government of Ferdinand I. was compelled to make a compact with this bandit. One of the robbers entered the royal service as a captain in 1818, and engaged to take captive his former comrades. Subsequently adventurers of all kinds united with them. The Austrian troops which occupied Naples were obliged to send large detachments to repress them. The bandits used to exact from strangers and natives a sum of money for protection, and give them in return a letter of security. In Sicily the Prince of Villa Franca declared himself, from political and other views, the protector of bandits; he gave them a livery and treated them with much confidence, which they never abused. We still hear of banditti in Italy, Sicily, Turkey, and elsewhere.

BANDON, a town of Ireland, on the Bandon, 20 miles s.w. of Cork. It is well built, but has no edifice of special note. Distilling, brewing, flour-mills, &c., are carried on. Pop. in 1891, 3438.

BANER, JOHAN, a Swedish general in the Thirty Years' war, was born near Stockholm in 1598. Gustavus Adolphus early prophesied that he was destined for greatness. He made his first campaigns in Poland and Russia, and accompanied the king to Germany. After the death of Gustavus in 1632 he had the chief command of the Swedish army. In 1634 he invaded Bohemia as field-marshal and general-in-chief of the Swedish army, defeated the Saxons at Wittstock, 24th September, 1636, and took Torgau. He ravaged Saxony again in 1639, and gained another victory at Chemnitz on 4th April. After invading Bohemia he again ravaged Saxony, and defeated Piccolomini in 1640. In the winter of 1641 he besieged Ratibon unsuccessfully, and died at Halberstadt in December of the same year, not without suspicion of poison. The pleasures

of the table and of love occupied all his leisure time, and probably immoderate indulgence was the real poison which brought on his death.

BANFF, the county town of Banffshire, is pleasantly situated on the river Deveron, which here enters the Moray Firth, and is crossed by a fine bridge of seven arches; 44 miles north-west from Aberdeen. The town consists of two parts, Banff proper and the Sea-town, the former partly on a flat and partly on a declivity rising from the Deveron, the latter on an elevated ridge almost overhanging the sea. It has several handsome streets. The town-house is a plain building, with a spire 100 feet high. The ancient castle, of which only a part of the outer wall and ditch remains, was a royal fortress. It is now represented by a plain modern building. The other buildings of note are the Parish, Free, and other churches, the Academy (now the Public School), Chalmers' Hospital, and the court-house, erected in 1870. Near the town are the County Lunatic Asylum, and Duff House, the seat of the Duke of Fife; and on a declivity on the other side of the Deveron is the town of Macduff, where an extensive fishing trade is carried on. Banff possesses an excellent harbour, which admits vessels of considerable tonnage. The chief exports are grain and fish; imports, coal, manure, timber, and iron. In 1898 there entered the port 449 vessels of 43,772 tons, and cleared 450 vessels of 43,240 tons. The number of vessels on the register of the port was 40; total tonnage, 3689. There is a rope and sail work, a ship-building yard, an iron-foundry, at which ploughs and other agricultural implements are manufactured, a hydropathic establishment, a brewery, and at a short distance from the town the largest distillery in Banffshire. A considerable number of the inhabitants are occupied in the herring, salmon, and other fisheries. Banff is one of the Elgin burghs, which together return a member to Parliament. Pop. of par. burgh, which includes Macduff, in 1891, 7578; Banff portion, 3871; in 1901, 7148; Banff portion, 3730.

BANFFSHIRE, a county in the north of Scotland, bounded on the north by the Moray Firth, on the west by the county of Moray and part of Inverness, on the south and east by the county of Aberdeen. The southern part of this county is very mountainous; but the northern part, although agreeably diversified with hill and dale, is comparatively low and fertile. The soil is for the most part a rich loam or deep clay. The principal rivers are the Spey and Deveron, with the Isla, a tributary of the former, and the Avon and Fiddich of the latter; besides which there are many other main and tributary streams. The mountains rise in altitude as they recede from the sea, the most celebrated being Cairngorm, which is 4095 feet high. The climate is of the general character of that of north-eastern Scotland. Agriculture is carried on with great spirit. The principal crops are barley, oats, turnips, and potatoes, little wheat being raised. Special attention is paid to the cultivation of turnips, the chief object of the farmer being the rearing and feeding of cattle. The total area of Banffshire is 410,000 acres. Several detached portions were formerly situated in Aberdeenshire. Nearly two-fifths of the total surface is under cultivation, and about one-fifth is occupied by woods and plantations. Since about the middle of the nineteenth century large tracts of formerly waste land have been reclaimed. In some parts attention is given to the rearing of sheep and horses. Fishing is a staple industry of the county. There are a number of herring-curing stations, with about 1800 boats, averaging from 15 to 16 tons each; cod, ling, haddock, &c., are also taken in considerable quantities. The salmon caught in the Spey and Deveron constitute

VOL. II.

an important article of traffic, the valued rental of the Duke of Richmond's salmon fishings in the former being over £12,000 a year. Banffshire possesses several woollen factories, tanneries, rope and sail works, ship-building yards, breweries, lime-works, and many distilleries, the whisky being generally known under the name of Glenlivet, a glen in the county. Among the natural productions limestone is the most prevalent. Serpentine also abounds in several places, especially at Portsoy, where it is known as 'Portsoy marble'; it is wrought into vases and other ornaments. Ironstone and manganese also occur, and Scotch topazes or cairngorm stones are found on the mountains in the south of the county. Banffshire returns one member to Parliament. Pop. in 1891, 84,167; in 1901, 81,487.

BANGALORE, a town of Hindustan, capital of Mysor, 70 miles north-east of Seringapatam. It stands on a plateau 3000 feet above sea-level, and is divided into two parts, the old native town and the cantonments. The chief buildings are the government house (where the British resident lives), the new public offices, the palace of the maharajah, the central jail, &c. There is a fine public pleasure-garden. In the old town stands the fort, reconstructed by Hyder Ali in 1761. Lord Cornwallis took it in 1791. Latterly the town has greatly prospered. There are manufactures of silks, cotton cloth, carpets, &c. Bangalore is noted for its salubrity. Pop. in 1881, 155,857; in 1891, 179,670.

BANGKOK, or **BANKOK**, the capital of the Kingdom of Siam, extending for 3 or 4 miles on both sides of the Menam, which falls into the Gulf of Siam, about 15 miles below. It consists of three parts—the town proper, the floating town, and the royal palace. The town proper occupies an island 7 or 8 miles in circuit, and is surrounded with walls and bastions; situated in the midst of gardens and luxuriant foliage it presents a very picturesque appearance. The floating town consists of wooden houses erected on bamboo rafts moored to the bank in rows eight or more in depth. The palace, occupying an island in the river, is surrounded by high walls. Though the general character of the buildings is not imposing, numerous temples, glittering with gilding, and terminating in lofty spires, are seen in many quarters. The trade, both inland and foreign, is very extensive. Exclusive of a very large junk trade with China, the exports consist chiefly of rice, sugar, pepper, sesame, lace, ivory, aromatic wood, wood for cabinet-work, tin, hides, &c.; the imports consist chiefly of Indian prints and British cotton and woollen goods. Pop. estimated at 500,000, of whom about a half are Chinese.

BANGOR, an episcopal city and par. borough of North Wales, in Carnarvonshire, finely situated near the northern entrance of the Menai Strait. It consists chiefly of one principal street about 1 mile in length, nestling in a narrow valley, but there is also a higher and more modern quarter called Upper Bangor, overlooking the strait. The principal public buildings are the cathedral, which was completed in 1532 and recently restored, the bishop's palace, deanery house, University College of North Wales, training college for teachers, &c. Since the construction of the Menai Bridge and railway, Bangor has risen into some importance, both as a favourite bathing-place and as an educational centre. The views of Beaumaris Bay and the Carnarvon mountains from Garth Point are very striking. It is one of the Carnarvon boroughs. Pop. in 1881, 8240; in 1891, 9892; in 1901, 11,269.

BANGOR, a seaport town, Ireland, County Down, situated on an acclivity on the south side of Belfast Lough, 4 miles north-west of Donaghadee. It consists

of three principal and several smaller streets, and has an Episcopal church, a Methodist and a Roman Catholic chapel, and two Presbyterian churches; an endowed school, six National schools, a Protestant hall, and a branch of the Belfast Bank. The male population is chiefly employed in seafaring pursuits, the females in hand-sewing in all its branches. Bangor is a favourite bathing resort. Pop. in 1891, 8334.

BANGOR, a city and port of the United States, capital of the county of Penobscot, in Maine, on the w. side of Penobscot River, at the head of the tide and of navigation. Pop. in 1890, 19,103. Its situation is pleasant, and very advantageous for commerce. It is a flourishing town, and contains a theological seminary, a court-house, and other public buildings. It is one of the largest lumber depôts in the world, and contains foundries, furniture manufactories, &c. The river is navigable as far as this town for vessels of the largest size.

BANGUE, BANG, a kind of drink much used throughout the East as a means of intoxication, prepared from the dried leaves of the Indian hemp, which are also called by this name. See **HASHISH**.

BANIANS, or **BANTYANS** (from Sanskrit *banî*, a merchant), the name commonly given by Europeans to Hindu merchants, brokers, &c., in Bengal and western Hindustan. They are often men of great wealth, and carry on most extensive dealings, their operations extending as far as the borders of the Russian and Chinese territories, the Persian Gulf, and Eastern Africa. They are great travellers, and have counting-houses in almost every trading town of importance in Asia. The English sailors call *banian* days those days on which they have no flesh meat. Probably the name has a reference to the habits of this class; because, before people were acquainted with the abstinence of all the Hindus, it was thought to be confined to the Banians.

BANIM, JOHN, an Irish writer, born in 1800, early exhibited a taste for literature, and before his twentieth year wrote a play called *Damon and Pythias*, which was afterwards performed at Drury Lane. His fame rests on his novels, particularly the *O'Hara Tales*, in which Irish life in all its features is admirably portrayed. He died in the neighbourhood of Kilkenny in 1842.

BANISHMENT. See **EXILE**.

BANJARMASSIN, a town, Borneo, near the south-eastern angle of the island, under the government of the Dutch, on an arm of the Banjar, about 14 miles above its mouth. Owing to the marshy ground and frequent inundations of the river the houses are built on piles, and many of them on rafts, the front next the river being used as a shop or stall on which wares are exposed for sale. On market-days the water is covered with skiffs, having a single individual in each, moving about selling vegetables, &c. The people are continually on the river, all necessities being purchased at these floating markets, and all business being done on the water. In every respect it is a floating town, possessing neither carriages nor horses; the only animals kept being pigs, goats, ducks, geese, and fowls. The houses of the European functionaries, the government buildings, and the fort, are built partly of stone and partly of wood. The fort *Tatas* is surrounded with palisades, and contains the resident's house, the magazines, and barracks. Exports—pepper, benzoin, bezoar, ratans, dragons'-blood, birds'-nests, iron, and straw mats, very artistically made; and imports—rice, salt, sugar, opium, coral, Chinese porcelain, silk, cutlery, gunpowder, &c. Pop. 40,000–50,000.

BANK. A bank may be defined as a trading establishment in which money forms the article of trade. The name is derived from the Italian *banco*

(itself from the German, and really the same word as *bench*), a bench, the early Italian bankers, who were the first of modern European bankers, being in the habit of transacting their business on benches or tables in the market-places of the principal towns. Banks are often divided into three classes, viz. of deposit, of discount, and of circulation. Many modern establishments combine in one the features of each of these classes, and most unite at least those of the first two. Taking them separately they may be characterized as follows:—1. A bank of deposit receives money to keep for the depositor until he draws it out. This is the first and most obvious purpose of these institutions. The goldsmiths of London were formerly bankers of this description; they took the money, bullion, plate, &c., of depositors, merely for safe-keeping. 2. A bank of discount is occupied in discounting promissory notes and bills of exchange, or in lending money on security. 3. A bank of circulation issues bills or notes of its own, intended to be the circulating currency or medium of exchange, instead of gold and silver. Banks are also divided into public and private, the former including such establishments of this kind as are under the direct control of the government of a nation or the municipal authorities of a place, as the Bank of Hamburg; or those the credit of which is connected with that of the government, or which are used as instruments in collecting and distributing the public revenues, or in which the government is a proprietor; those also are usually considered to be public banks which are carried on under a charter from the government; whereas a private bank is usually understood to be one that is carried on by one or more individuals without any particular connection with the government, or any special authority or charter, and whose capital is not in the form of stock or shares. The Bank of England, which is closely connected with government, is thus a public bank, and the joint-stock banks of England and Scotland whose shares are bought and sold in open market may also be so called. In the United States most of the banks are public, and in some of the states private banks of circulation are prohibited by law. We shall now give a short general account of the main features in the management of modern banks.

The most important banks are those that combine the three branches of receiving money or valuables on deposit, of discounting bills or promissory notes and lending money on security, and of issuing promissory notes (usually called bank-notes) of their own. Banks that receive money on deposit may or may not allow their customers interest on their deposits, and the Bank of England and many other banks do not; in any case, they themselves as a rule obtain a profit upon the deposits by investing or lending them out upon proper security. If they allow interest upon the deposits it is plain that they must employ them in such a way as to obtain themselves a higher rate of interest than what they allow. One common method of making a profit upon the money of depositors is by advancing it in the discount of bills of exchange not having long periods to run, the banker receiving the amount of the bills from the acceptors when the bills arrive at maturity. The issue of notes is also a source of profit to a bank, inasmuch as it enables the bank to lend these notes or promises to pay as if they were so much money and to receive interest on the loan accordingly, as well as to make a profitable use of the money or property that may be received in exchange for its notes so long as the latter remain in circulation. Of course as the notes represent money, and as money may be demanded for them from the bank at any time, the bank, if sound, will possess money or other valuables

equivalent to the value represented by the notes; yet a bank may be in a perfectly sound and healthy condition though not able to pay cash for its notes if payment were demanded for them all at once. In this country the extent to which banks can issue notes has been limited by act of Parliament, as explained below.

Before a banking business can be commenced it is necessary that those commencing it should be known to have considerable wealth in their possession, otherwise the public could have no confidence in the undertaking, and would have nothing to do with it; for few persons of prudence would intrust their money to one who might lose it by a few bad debts, and have no means of repaying it. The business of banking then is usually carried on by co-partneries or joint-stock concerns, in which a number of persons unite to raise the necessary money, or *capital*, as it is called, to start with. It is usually considered that for sound banking this capital should not be traded with for the purpose of making gain in the same way as the money deposited with the bank; it should be invested in government or other securities subject to little fluctuation in value, and that can always be readily converted into money in the case of any large and unexpected demand (or *run*) made upon the bank by those who have deposited money in it. Whether the whole capital is so employed or not prudence demands that a sufficient *reserve* shall at any rate be kept in order to provide against seasons of commercial crisis or panic, when depositors, taking alarm, may rush to withdraw their deposits, and so compel the bank to suspend payment even though really solvent. In most cases such a suspension must be followed by the winding up of the concern, for public confidence once lost is seldom or never regained by a bank. Banks have often got into difficulties through not keeping a sufficient reserve, though of course there is always a temptation to keep it as small as possible since it is less profitable than the money they are lending out and receiving interest for. The reserve of the banking department of the Bank of England is always in notes and coin, or it may be said entirely in coin and bullion, as the notes are always represented by an equivalent amount of coin and bullion, in the issue department of the bank. The other banks have their reserve partly in coin and bullion, but chiefly in government stock and Bank of England notes. Sometimes the reserve of these banks is lying as a deposit in the Bank of England.

As already mentioned, a large amount of the lending done by the banks is in the shape of discounting bills of exchange, those, when representing bona fide mercantile transactions, being among the most legitimate objects upon which the banker's funds may be employed. A merchant, for instance, sells a certain quantity of goods, the buyer does not pay them in cash, but gives a bill at two or three months, promising to pay at the end of that period; this bill is taken by the holder to his banker, who gives him the money there and then, less the discount, that is, the interest on the bill from the date of the transaction till the time the bill will fall due. Loans or advances are also often made by bankers on *exchequer bills* or other government securities, on railway debentures, or the stock of public companies of various kinds, as well as on goods lying in public warehouses, the owner transferring to the banker in security the dock-warrant or certificate of his ownership. Loans are also made on the note of hand of a borrower, without further security, when the banker is satisfied that the loan will be duly paid. Money is less commonly advanced on mortgages on land, as in these cases the loans are usually unpaid for years; still in a large business a certain amount of money

may be so invested. Of all sorts of speculative undertakings the banker must beware. Of mining speculations, therefore, especially if foreign, of foreign railways and land schemes, he will generally steer clear. Of course it is impossible for a banker, any more than traders in general, to avoid making bad debts sometimes, and it often requires firm and skillful management to avoid throwing good money after bad. Thus, 'A customer manufacturing largely applies for an advance, offering a mortgage of landed property on advantageous terms as security; the advance is made, but after a time the customer returns representing that he has made bad debts which cannot at present be realized, and that he is in want of cash to carry on his concerns, and that if he is not accommodated the result will be that he must stop, in which case, in the present posture of affairs, the banker will in all probability be a loser. The banker therefore consents to a further loan, taking perhaps as security a bill of sale of the manufacturer's plant and machinery. Such cases too frequently end in the banker suffering great loss, which becomes known; his credit is accordingly impaired, the customers become alarmed for the safety of their deposits, a run upon the bank ensues, it is obliged to stop payment, and the end is bankruptcy and ruin.'

Banks are of the utmost value to a community for various reasons. Thus by receiving deposits of money they are the means of keeping fully and constantly employed a large portion of the capital of the community, which, but for their agency, would frequently lie dormant and unproductive. They are also the means by which the surplus capital of one part of a country is transferred to another, where it is required and where it may be advantageously employed in stimulating industry and giving support to labour. In the more purely agricultural districts of England, for instance, bankers will have larger deposits than they can profitably employ in discounting or in other ways in their own neighbourhoods; they will therefore probably transfer what money they can spare to London, where it may be employed in discounting bills of exchange drawn in the great manufacturing cities of the north. Another way in which banks are of incalculable service is in enabling vast and numerous money transactions to be carried on without the intervention of coin or notes at all, and thus obviating a great amount of trouble, risk, and expense. Thus a customer of a bank, when he has a payment to make, will not hand over the necessary amount in coin and gold, he will merely write a cheque upon his banker requesting him to pay the amount to the creditor, and if the latter have an account at the same bank he will be satisfied if a corresponding sum is transferred to his name. In London, which is the money centre of the world, the importance of this system is best seen. Here there is an establishment called the *clearing-house* in which every day a comparison is made of the amounts of the drafts then payable which each bank that is a member of the establishment holds against the others; when the balances or differences for or against each bank are ascertained, the differences due by the respective banks are settled by transfers from one account to another at the Bank of England. Country as well as London banks can take advantage of the clearing-house, each country banker sending cheques on other country banks to his London correspondent, who exchanges them with the correspondents of the bankers on whom they are drawn. In this way a weekly clearing of 120 to 130 millions sterling is often made without the intervention of a single coin or note.

A banker stands to his customer usually in the relation of debtor to creditor, the banker holding money which the customer may demand at any time

in whole or in part, by means of a cheque payable at sight by the banker when presented during the banking hours of his establishment. When the customer has an account current with the banking house the banker is bound to pay his customer's cheques at all times to the full extent of what money he may have in hand belonging to the latter. And the law regards the banker as bound to know his customer's signature and be able to distinguish what is not his, and therefore if he cash a cheque bearing a forged signature he will have to bear the loss. Also, if the banker refuse to cash a cheque from an erroneous supposition that he has no funds of his customer's in his hands he will be liable to an action at the suit of the customer. 'The banker is held to be under the obligation of knowing what is in his books; he cannot, for instance, escape from the consequences of making or joining in a representation of the affairs of the bank different from that which the facts authorize, by alleging that he was not in the habit of looking into the books, and did not know that what he stated or sanctioned was untrue. It is his duty—a duty that the law does not allow him to shake off—to be aware of the position in which the bank stands before he undertakes to make statements respecting that position by relying on which other persons may suffer.'

Persons are mentioned as carrying on the trade of bankers in ancient Greece, acting as money-changers, receiving money on deposit and paying interest on it, and lending money on security at a higher rate of interest. They were known as *trapezita*, from *trapeza*, a bench or table, their name thus corresponding exactly with the modern banker. A similar designation—*mensarii*, from *mensa*, a table—was applied to a money-dealing class at Rome, these being public bankers appointed by the state, while private bankers were known by the name of *argentarii* (from *argentum*, silver, money). Modern banking, however, took its rise in the middle ages, Italy, as already mentioned, being the country in which it had its origin. In the twelfth century almost the whole trade of Europe was in the hands of the Italian cities, and it was here naturally that the need for bankers was first felt. The bankers of Florence in particular became known at an early period. The first public bank, however, was that of Venice, which was established as early as 1171, during the Crusades, and for the purpose of rendering assistance to those expeditions. It was a bank of deposit only, and strictly a public bank, as the government became responsible for the deposits, and the whole capital was, in effect, a public loan, the funds of the bank being made use of by the government. In the early periods of the operations of this bank the funds were not withdrawn when once deposited, but the depositor had a credit at the bank to the amount deposited, and he used the money so deposited by transferring this credit to another person instead of paying money. Subsequently, however, the deposits were allowed to be withdrawn; for, though the bank credits answered all the purposes of money at Venice, a specie currency was wanted by persons going abroad, or having payments to make in distant places. This bank continued in operation until the dissolution of the Venetian Republic in 1797.

Another important bank of deposit, the Bank of Amsterdam, was established in 1609, and owed its origin to the clipped and worn currency, which, being of uncertain and fluctuating value, subjected the exchange to a corresponding fluctuation and uncertainty. The object of the institution (established under the guarantee of the city) was to give a certain and unquestionable value to a bill on Amsterdam; and for this purpose the various coins were received in deposit at the bank at a certain value, according to their

weight and fineness, a small deduction being made, equivalent to the supposed expense of coinage into money of the proper weight and fineness, and the depositor was also required to pay a small amount for the privilege of having an account at the bank. As the money received was not, in fact, recoined, these charges, with a charge for deposits of bullion, for every new deposit, and for every transfer, constituted the income of the establishment, and being more than sufficient to defray the expenses a net revenue accrued to the city. The deposits made and credited were denominated *bank money*, which was at a certain premium or agio above current money, according to the fineness and weight of the current coin; and after the currency was well regulated this agio was steady and inconsiderable, never exceeding 5 per cent. It was provided by law that all payments of 600 guilders and upwards should be made in bank money; and payments were made by transfers of credits in the bank books, as in the Bank of Venice. The deposits of the Bank of Amsterdam were not intended to be lent out either to government or private borrowers, but were to remain in the coffers of the bank. The temptation to make a profit by these idle deposits, however, ultimately became too great, and the managers lent them out secretly to the government and the East India Company. At the time of the French revolution they were unable to make good their loans, and this breach of faith led to the fall of the institution.

A bank of similar character, the Bank of Hamburg, established in 1619, is also a mere bank of deposit and transfer, the deposits being made in bullion at a certain fixed rate, and liable to be withdrawn by the depositors. The bank has not properly, therefore, any capital of its own, the whole funds being liable to be withdrawn at any moment. It charges on transactions $\frac{1}{4}$ per cent. for its expenses. This bank was plundered by Davoust when he was in possession of Hamburg, in 1813; but many of the depositors, anticipating this event, had withdrawn their deposits, and remitted them to Copenhagen or England; and to those who remitted to England it proved quite a fortunate event, for by the subsequent rise of exchange they nearly doubled their capital. The depositors who were thus plundered of their property received a partial indemnity of 86 per cent from the French government after the restoration of the Bourbons. The city is responsible for all deposits, and the directors of the bank are chosen annually by the whole body of the citizens of Hamburg having a right to vote for municipal officers.

The first bank of deposit and circulation established in Europe seems to have been that of Barcelona, where a bank was opened in 1401 by the municipal authorities, who declared themselves answerable for money lodged in their bank.

The first bank of importance established in the United Kingdom was the Bank of England in 1694, the banking business having previously been carried on entirely by private bankers. From the beginning it was a public bank, having advanced its original capital of £1,200,000 to the government and received in return certain valuable and special privileges. It was followed in 1695 by the Bank of Scotland, an establishment of far less financial importance but yet one which was the pioneer to a system which has more than any other contributed to the excellence of modern banking. Ireland did not have a public bank till 1789, when the Bank of Ireland was instituted on the model of the Bank of England. From 1708 to 1826 the Bank of England was the only banking establishment in this portion of the United Kingdom that was permitted to have more than six partners; at the latter period joint-stock banks of

issues were allowed in places beyond the metropolitan district, and in 1838 non-issuing banks of this kind were allowed within the metropolitan district. The Bank of Ireland had a similar monopoly up to 1834. At present the Bank of England monopolizes the circulation within sixty-five miles of London, beyond which radius there are a large number of provincial issuing banks, both private and joint-stock. New banks of issue, however, whether in England, Scotland, or Ireland, are prohibited, and existing banks are limited as to the amount of notes they may issue, unless, in the case of the Scotch and Irish banks, the excess is balanced by specie. In England all notes issued must be of the value of £5 and upwards, while in Scotland and Ireland notes of £1 and upwards are allowed. Bank of England notes are a legal tender except in Scotland and Ireland.

Of all banking establishments in the world the most important that has ever existed is the *Bank of England*, which combines the functions of a bank of deposit, discount, and circulation. Its principal projector, William Paterson, was also the promoter of the disastrous Darien scheme. It was chartered in the reign of William and Mary, 1694, seventy or eighty years after those of Amsterdam and Hamburg, by an act which, among other things, secured certain recompenses and advantages to such persons as should advance the sum of £1,500,000 towards carrying on the war against France. The sum of £1,200,000 was subscribed before the expiration of the year, and the subscribers became, under the act, stockholders, to the amount of their respective subscriptions, in the capital stock of a corporation, denominated the *Governor and Company of the Bank of England*. This charter was granted for eleven years, the company having advanced to the government the £1,200,000 at an interest of 8 per cent, while the government made an additional bonus or allowance to the bank of £4000 annually, for the management of this loan (which, in fact, constituted the capital of the bank), and for settling the interest and making transfers, &c., among the various stockholders. This bank, like that of Venice, was thus originally an engine of the government, and not a mere commercial establishment. Its capital has been increased from time to time, the original capital of £1,200,000 being in 1708 raised to £4,402,348, in 1722 to £8,959,998, in 1742 to £9,800,000, in 1746 to £10,780,000, in 1781 to £11,642,400, in 1816 to £14,553,000. Up to the present time no further augmentation of capital has taken place. There exists besides, however, a 'rest' of over £3,000,000.

As above mentioned, the charter of the bank was originally granted for eleven years certain, or till a year's notice after August 1, 1705. It was subsequently renewed at various times and for various periods, certain conditions which the bank had to fulfil being specified at each renewal. The first renewal was in 1697, the next succeeding were in 1708 and 1713, on the latter of which occasions the charter was continued till twelve months' notice after August 1, 1742. Before this period arrived a large increase in the permanent debt due by the government to the bank had taken place, the total amount due in 1738 being £9,100,000. The remaining renewals of the charter were in 1742, 1764, 1781, 1800, 1833, 1844. On the last occasion it was continued till twelve months' notice from 1855. At the same time the issue department of the bank was established as distinct from the general banking department, the sole business intrusted to the former being the issue of notes. By this arrangement the bank was authorized to issue notes to the value of £14,000,000 upon securities specially set apart, the most important of the securities being the sum of £11,015,100 due to the bank

by the government, together with so much of the coin and bullion then held by the bank as was not required by the banking department. This being done there was to be issued such an amount of notes as with those then in circulation should be equal to the coin, bullion, and securities transferred to the new department, the notes in circulation to be regarded as issued on the credit of the said securities, coin, and bullion. Beyond the £14,000,000, therefore, no notes were to be issued unless an equivalent amount of coin or bullion were lodged in the coffers of the bank. The bank was permitted, however, to increase its issue on securities by an amount equal to two-thirds the issue of English provincial banks which should cease to issue, and thus its authorized issue on securities has been increased to £17,775,000. For every note that the issue department may issue beyond the total sum of £17,775,000 an equivalent amount of coin or bullion must be paid into the coffers of the bank. The Bank of England notes are, therefore, really equivalent to, and at any time convertible into gold, as it is in the utmost degree improbable that any drain on the treasure in the bank can take place so great as to reduce the outstanding notes below £17,775,000.

In compliance with the act of 1844 a weekly account has to be issued by the bank, comprising, in the issue department, the notes issued, and the securities and coin, &c., held against them; in the banking department the capital, rest, deposits, &c., for which the bank is responsible on the one hand, and the gold, notes, and securities held against them on the other. Notes once issued by the bank and returned to it are not reissued, but are destroyed—a system which has been adopted in order to facilitate the keeping of an account of the numbers of the notes in circulation, and so prevent successful forgery. The following is a specimen of the weekly accounts of the Bank of England:—

Week ending July 31, 1903
Issue Department.

Dr Notes issued, . . . £58,897,865	Cr Government debt, £11,015,100 Other securities, . . . 6,759,900 Gold coin and bullion, 35,612,865
£58,897,865	£58,897,865

Banking Department.

Dr Proprietors' capital, £14,553,000 Proprietors' rest, . . . 3,478,619 Public deposits, . . . 10,881,300 Other deposits, . . . 42,498,701 Seven days' bills, . . . 142,141	Cr Government securities, . . . £16,986,460 Other securities, . . . 28,880,545 Notes unemployed, 28,820,415 Coin, 2,311,401
£71,498,821	£71,498,821

As will be seen from the above statement the issue department is credited with the government debt and other securities, amounting to £17,775,000, and with a varying amount of coin and bullion, and debited with the notes issued to the banking department and the public, the amount of these always being equivalent to the securities and bullion held. The total of the notes given out by the issue department is called the 'issue circulation', the portion of it in the hands of the public being the 'active circulation', and that still in the banking department being the 'note reserve'. This note reserve represents really the amount of bullion in the issue department available for the use of the banking department, as will be seen by combining the two accounts and eliminating the unissued notes (as being simply so much paper), when an equivalent sum in coin or bullion will remain in excess of that required by the act of 1844. The banking department is debited with the fixed

capital of the bank and with the 'rest', which is a varying surplus increased always by accumulated profits up to April 5th and October 10th, when the bank dividends are paid to the shareholders. Another item on the debit side is the public deposits, including sums lodged on account of the customs, inland revenue, &c.; the public deposits increase through revenue receipts until the dividend terms in January, April, July, and October. The other or private deposits comprise those of bankers, merchants, and other persons. On the credit side are the government securities, a safe and readily-convertible investment; other securities, or such as are composed of bills discounted, and stocks, bonds, &c., on which advances have been made; and lastly, the reserve notes and coin in hand for immediate use. These weekly returns afford valuable information as to the state of the money market, its movements and tendencies. Thus an increase in the private deposits indicates an increase of monetary ease, while a decrease informs us that bankers, merchants, and traders have calls upon them for money. A better indication of the demand for money is furnished, however, by the advances on commercial securities, and it is by this and the condition of the reserve that the bank rate of discount is regulated, which, as being a practical index of the value of capital, materially influences transactions throughout the kingdom. When the reserve is high and the advances moderate the discount rate is low, and it is raised according as the reserve falls and advances are more in request, especially during an adverse foreign exchange and drain of gold. Capital is thus restrained from going abroad, and, on the contrary, its influx into the country is encouraged. Owing to London being the entrepôt of the mining countries a demand for gold may be met without the bank's reserve being disturbed; but under exceptional circumstances, political or financial, the bank is watchful of a diminution of the bullion, and may raise the discount rate even while the reserve is good and the foreign exchange not unfavourable.

Besides its importance to the government as a public creditor, and as an agent in managing the finances and public debt, collecting taxes, and paying interest and annuities, this institution is, in its character of a bank of deposit, discount, and circulation, a powerful instrument of commerce and industry. It takes charge of the reserves kept by the London bankers for the carrying on of their business; it opens drawing accounts with merchants and others, on which they may draw and pay in as in ordinary banks; it discounts bills of exchange for its customers, takes charge of exchequer bills and bills of exchange, of the collection of bills of exchange, receipt of dividends, &c. The ordinary limit of maturity for bills discounted is ninety days, but advances are made for regular customers on good bills running even for six months, as well as on good securities of other kinds. The minimum rate of discount is regularly advertised. Plate, deeds, securities, &c., may be deposited with the bank for security free of charge. It does not pay any interest on deposits. A commission is charged on accounts that are not considered remunerative, but ordinarily the balance of cash standing at the customer's credit is sufficient to repay the trouble of keeping his account. Besides the head office and two branch offices in London, the bank has established branches in Birmingham, Bristol, Hull, Leeds, Liverpool, Manchester, Newcastle, Plymouth, and Portsmouth.

The management of the bank is in the hands of a governor, deputy-governor, and twenty-four directors, elected by stockholders who have held £500 of stock for six months previous to the election. A director

is required to hold £2000, a deputy-governor £8000, and a governor £4000 of the stock. The court or board of directors meets every Thursday, when the weekly account is presented. The two governors have the chief administration of the institution and attend at the bank daily. Subject to the court, the three departments of issue, banking, and public debt are worked by two chief officers, namely, the chief accountant and the chief cashier, the former having supervision of all the accounts, the latter having charge of all money matters. Including clerks in the branches, mechanics, &c., the bank employs upwards of 1000 persons, of whom about 400 are in the national debt department. The bank building covers about 4 acres. The total annual expenditure is said to be nearly £240,000, besides about £20,000 for pensions. In addition to what profit the bank makes by ordinary banking business it receives an allowance for the management of the national debt, &c. By an act passed in 1892 this allowance was settled at £325 per million on £500,000,000 of the debt, and £100 per million on all debt above that sum. The sum of £180,000 per annum has to be paid to government, however, on account of the special privileges the bank possesses. One source of profit is in the foreign coin and bullion brought to the bank, for which it pays at the rate of £3, 17s. 9d. per ounce, or 1½d. per ounce less than the real value. The dividend paid the shareholders is usually from £8 to £10 per cent.

Joint-stock and other English Banks.—The other English banks consist of numerous joint-stock and private banks in London and the provinces, many of the provincial establishments of both kinds having the right to issue notes. Private banks in London with not more than six partners have never been prevented from issuing notes, but they have long ceased to do so, as they could not profitably compete with the powerful Bank of England. As already stated the maximum issues of the provincial banks are limited to a certain amount, against which they are not compelled to hold gold in reserve, and they have no power to issue against specie in excess of the fixed circulation. Their actual issues are considerably below this amount. No union can take place between a joint-stock bank and a private bank, or between two joint-stock banks of issue, without one of them losing its issue. The aggregate issue of these banks, which was fixed on the average of the twelve weeks previous to April 27, 1844, originally amounted to £8,848,868, but has now decreased to about £2,600,000, distributed partly among private and partly among joint-stock banks (both decreasing in number through amalgamations, &c.). The notes of these banks are payable in Bank of England paper. The joint-stock banks are partly with limited partly with unlimited liability against the shareholders, but the greater number of them are limited. Of English joint-stock banks with limited liability we may mention the following as among those having the largest paid-up capital: Barclay & Co., paid-up capital £2,416,800; Capital and Counties Bank, £1,210,000; Lloyds' Bank, £2,848,000; London and County Banking Co., £2,000,000; London City and Midland, £3,000,000; London Joint-Stock Bank, £1,800,000; London and Westminster Bank, £2,800,000; National Bank, £1,600,000; National Provincial Bank of England, £3,000,000; Parr's Bank, £1,463,600; Union Bank of London, £1,705,000; Williams Deacon, &c., £1,000,000—these having headquarters in London; in the provinces those having the largest paid-up capital are: Bank of Liverpool, £1,000,000; and the Manchester and Liverpool District Banking Company, £1,250,000. Some of these have a number of branches. All the joint-stock banks allow interest

on money deposited with them; both they and the private banks derive the chief part of their profits from the use of their deposits in discounting and otherwise.

Banks in Scotland.—In Scotland there are no private banks, the only banks in that portion of the United Kingdom being joint-stock banks of issue. By the act of 1845 new banks of issue were prohibited, a monopoly being given to such establishments as existed in the year previous to 1st May, 1845. At the same time the issue of each was limited to the amount of its average circulation during that year, and of the specie held at the head-office. Should two banks join, the united bank may issue to the amount of their separate circulations. Any bank issuing notes in excess of this limit must hold an equivalent amount of gold. As a rule the average circulation is much above the authorized circulation. (See table below.) All the banks have a number of branches throughout the country, no village of any size being without one or more. The Bank of Scotland, established by act of Parliament in 1695, enjoyed, by terms of its charter, for twenty-one years the exclusive privilege of issuing notes in Scotland, but it has never held the position of a national bank like the Bank of England and Bank of Ireland. Its original capital was only £100,000. It was increased to £200,000 in 1744; and now amounts to £1,250,000 paid up. It remained the only bank in Scotland till the Royal Bank of Scotland was established in 1727. The original capital of the latter was £151,000. At present it amounts to £2,000,000. The British Linen Company was incorporated in 1746, for the purpose of promoting the linen manufacture, but soon became a general banking company. Its capital amounts to £1,250,000. These three banks claim to be by their charters banks of limited liability. All the other Scottish banks have been established within the present century. They are all incorporated by royal charter or act of Parliament, which enables them to sue and be sued as a corporation, and latterly they have all become banks of limited liability, except that their liability is not to be limited in respect

to their note issue. The Bank of Scotland began to issue one-pound notes so early as 1704; and the issue of these has since been continued without interruption, such notes forming a large and useful portion of the currency of Scotland. This bank early received money on deposit, and allowed interest on it, and in 1799 it introduced the system of cash credits or cash accounts which form an important feature in Scotch banking. This species of account does not differ in principle from an over-drawing account at a private banker's in England. A cash credit is a credit given to an individual by a banking company for a limited sum, seldom under £100 or £200, upon his own security and that of two or three individuals approved by the bank, who become sureties for its payment. The individual who has obtained such a credit is enabled to draw the whole sum or any part of it when he pleases; replacing it, or portions of it, according as he finds it convenient, interest being charged upon such part only as he draws out. Cash credits are chiefly of use to a trader as a means of increasing his capital. As permanent security of an acceptable kind is not easily procured they are much less resorted to in ordinary business than the common means of raising money by discounts; but they afford facility to men of means, especially when retired from business, for assisting young friends or relatives in commencing it. From allowing a moderate rate of interest on money deposited with them, the Scottish banks are intrusted with large sums, and it used to be common for depositors to lodge their money permanently as an investment. The habit of keeping an account with a banker is said to be 'incomparably more general' in Scotland than in England. The aggregate of the banks and branches in Scotland (over 1000) is more than a third of that of England and Wales. The total sum deposited with them is now rather more than £100,000,000. Several of the Scotch banks have now branch offices in London, and two of them have a branch or two in the north of England. Of course they cannot issue their own notes from these offices.

A List of the Banking Companies of Scotland in 1907 with the Amount of their paid-up Capital and Reserves, the Amount of Note Circulation authorized without Gold being held against it, the Average Amount of Notes in Circulation, and the Amount of Deposits.

Instit. founded	Name.	Head Offices	Paid-up Capital	Reserves	Authorized Circulation	Average Circulation	Deposits.
			£	£	£	£	£
1695	Bank of Scotland	Edinburgh ..	1,250,000	712,000	343,419	1,070,000	15,063,000
1727	Royal Bank of Scotland	Edinburgh ..	2,000,000	821,000	216,461	1,000,000	13,388,000
1746	British Linen Company Bank	Edinburgh ..	1,250,000	1,711,000	438,024	888,000	12,568,000
1810	The Commercial Bank of Scotland Limited	Edinburgh ..	1,000,000	968,000	374,880	1,085,000	14,270,000
1825	The National Bank of Scotland Limited	Edinburgh ..	1,000,000	1,112,000	297,024	960,000	15,550,000
1850	The Union Bank of Scotland Limited	Glas. and Edin.	1,000,000	709,000	454,340	1,022,000	12,238,000
1852	The Town and County Bank Limited	Aberdeen	250,000	169,000	70,183	310,000	2,718,000
1856	North of Scotland Banking Company Ltd.	Aberdeen	400,000	188,000	154,319	498,000	3,794,000
1858	The Clydesdale Bank Limited	Glasgow	1,000,000	606,000	274,321	544,000	10,217,000
1858	Caledonian Banking Company Limited	Inverness	150,000	81,000	58,484	152,000	1,045,000
	Total		9,802,000	7,007,000	2,676,380	7,855,000	100,807,000

The Scotch banks have generally been managed with skill, prudence, and success; they have enjoyed a high reputation for stability, and their shares have been looked upon as a safe and remunerative investment. On the whole this estimation seems to have been deserved, though public confidence in these establishments was somewhat shaken when, in 1857, the Western Bank failed, and another Glasgow bank, the City of Glasgow, was compelled to shut its doors for a time; and it received a still suder and probably a more lasting shock when in 1878 the latter bank, which had soon recommenced business, and had long been in apparent prosperity, collapsed entirely with

disastrous results, bringing ruin upon many hundreds if not thousands of persons connected with it. In December, 1878, the gross liabilities of the bank were estimated by the liquidators at somewhat over £12,000,000, of which fully £8,000,000 fell to be made good by the unfortunate shareholders, a result far worse than in the case of the Western Bank. This catastrophe was brought about by the bank recklessly lending immense sums of money without sufficient security to a few firms engaged in speculative trading, its management for a number of years before the failure being entirely contrary to the maxims regulating any sound system of banking.

The manager and directors were prosecuted by the crown, and condemned to various terms of imprisonment. The Caledonian Bank was forced to suspend payment temporarily through holding several shares in the City of Glasgow Bank.

Banks in Ireland.—The banks in Ireland consist of one public or national bank, the Bank of Ireland, and of limited joint-stock and private banks. The authorized note circulation is in the hands of the Bank of Ireland and the other joint-stock banks of issue, and is arranged on the same footing as that of the Scotch banks. If any bank discontinues its issue and issues notes of the Bank of Ireland, the circulation of the latter may be to an equal amount increased. The authorized circulation as shown in the accompanying table is £6,854,494, the actual circulation is sometimes a little above, sometimes a little below. The Bank of Ireland has lent the greater portion of its capital to government. It was established by charter in 1783, with similar privileges to those granted to the Bank of England. Its capital is £2,789,230 (or £3,000,000 Irish); it has also a rest or reserve of over £1,000,000. The bank allows interest on deposits when for a stated period.

A List of the Irish Joint-stock Banks, with the Dates of their Establishment, the Amount of their Paid-up Capital, the Situation of their Head Offices, and their Fixed Issues.

Name.	Date	Paid-up Capital.	Head Office.	Amount of Fixed Issues.
		£		£
Bank of Ireland,.....	1783	2,789,230	Dublin.	2,788,428
Belfast Banking Co.,.....	1827	400,000	Belfast	281,611
Elthamian Bank,.....	1826	500,000	Dublin.	No issue
Munster and Leinster Bank,.....	1835	200,000	Cork.	Do.
National Bank,.....	1835	1,500,000	London	852,269
Northern Banking Co.,.....	1825	413,313	Belfast	243,440
Provincial Bank of Ireland,.....	1825	540,000	London.	927,667
Royal Bank of Ireland,.....	1836	800,000	Dublin.	No issue
Ulster Bank,.....	1836	450,000	Belfast	811,079
Total,.... 6,854,494				

Bank of France.—Of all other banks the Bank of France is second in importance only to the Bank of England. It was established in the beginning of the present century, at first with a capital of 45,000,000 francs, which in 1806 was increased to 90,000,000 francs, the bank having the exclusive privilege in Paris of issuing notes payable to the bearer, a privilege which it has continued to retain, besides becoming since that time the only authorized issuer of such paper in France. It has a number of branches established in the larger towns of the kingdom. A number of these were acquired in 1848, when certain joint-stock banks of issue, which had been established in some of the principal cities, were by government decree incorporated with the Bank of France, the capital of which was then increased to 91,250,000 francs (£3,850,000), in 91,250 shares of 1000 francs each, the issue of notes by provincial banks being then prohibited. In 1857 the capital was doubled, being then raised to 182,500 shares of 1000 francs each. Besides which it has a large surplus capital or rest. This, like the Bank of England, is a bank of deposit, discount, and circulation. It discounts paper on which there are three responsible names if it has not more than ninety days to run, it makes advances on stocks and securities of various kinds, and undertakes the care of plate, jewels, &c., at a small charge. Like the Bank of England it discounts, or, in other words, makes advances upon the public taxes, and is a large creditor of the state. The government appoints the governor, with a salary of 100,000 francs, who is required to be a stockholder to the amount of 50,000 francs, and the two deputy-governors, with a salary of 50,000 francs each, who

must each own stock to the amount of 25,000 francs. There is also a body of fifteen directors and three censors, nominated by the shareholders. Under the Commune (1871) the bank was threatened with spoliation, but this it escaped. In the month of Dec. 1898, the specie it held amounted to 3,048,182,000 francs (£121,927,300), and the value of its note circulation to 3,799,238,000 francs (£151,969,800).

United States Banks.—The greater number of the banks of the United States are what are called national banks, established in accordance with an act passed in 1863. Associations of this kind at starting must invest at least a third of their paid-up capital in government bonds, which pay them an interest of 5 per cent, more or less. They then obtain from the government bureau, established for the purpose, 90 per cent of paper money sheets, which they sign and pay out, this constituting their note circulation. These banks pay no interest to depositors. Besides the notes of these banks a large portion of the currency of the United States consists of government notes issued from the national treasury. There are also banks chartered by the different states.

Banks, Savings.—Savings-banks are of comparatively recent origin, and they have already accomplished much good. They afford an opportunity for those who have anything to spare, not only to deposit their savings in safety, but to receive interest for the sums so secured, against a time of sickness, or distress, or age. One of the first attempts with which we are acquainted to realize such an institution was made by Mrs. Priscilla Wakefield at Tottenham, near London, in 1803, in which small sums were received and interest allowed on them. The first savings-bank in Scotland was formed in 1810 by the Rev. Henry Duncan, minister of Ruthwell, Dumfriesshire; in 1814 the Edinburgh savings-bank was established on the same principles, and the system soon spread over the kingdom. The first act relating to savings-banks was passed in 1817, and at that time there were seventy-eight savings-banks in operation in England, Wales, and Ireland. The first act affecting Scotch banks was passed in 1818. By the act of 1817 all deposits in savings-banks, as soon as they reached £50, were placed in the hands of the National Debt Commissioners, who allowed interest on them at the rate of £4, 11s. 3d. per cent. The interest received by the depositors was less than this, however, the difference being required to cover the expense of carrying on the business of the banks. Since that time various alterations have been introduced by different acts, the last being in 1893. In 1824 it was enacted that the deposits for the first year should not exceed £50, nor those in subsequent years £30, the total deposits being limited to £150; also, that no more interest should be paid when the deposit, with accrued interest, in the name of one individual, should amount to £200. £50 may now be deposited in one year, and when interest raises the total above £200 the excess is invested in government stock. By the act of 1844 the interest allowed by the commissioners to the trustees of savings-banks was reduced to £3, 5s. per cent, and the interest allowed to depositors to £3, 0s. 10d. per cent. The interest has been still further reduced since, and depositors now receive rather less than £2, 10s. An act of 1833 had provided for the purchase of government annuities by depositors either for life or for a term of years; and an annuity of any amount up to £100 may be obtained. An act of 1880 made provision to enable depositors to invest their savings in government stock, it being stipulated that the sum invested should not be less than £10. Smaller sums may now be thus invested, but the amount of stock credited to any one in a single

year is not to be more than £200, and the whole amount credited to a single account is not to exceed £500. The savings-banks in the different localities are under the control of registered trustees and managers, who receive no remuneration. These appoint certain paid officers, who have to give security for their intrusions. The number of savings-banks in the United Kingdom is now about 230, number of accounts remaining open 1,527,000, amount owing to depositors £48,500,000.—*Post-office Savings-banks.* These have been established in connection with the money-order department of the post-office by an act of parliament passed in 1861. They have become extremely popular, so much so that a great number of the trustee savings-banks have been closed, and their funds transferred to the post-office banks. The following are now the chief provisions relating to these banks:—Any sum not less than a shilling (the shilling may be in the shape of postage stamps stuck on a particular form) is received, so as not to exceed £50 in one year, or more than £200 in all, interest or dividends over this being invested in government stock. Interest is paid on every complete pound at the rate of 2½ per cent, but none on fractional parts of a pound. The depositor receives a book in which all his deposits are entered and signed by the postmaster of the office in which the deposit is made. He also receives a receipt for every deposit from the postmaster-general. For these deposits the government is responsible, and they may be drawn from any post-office savings-bank in the kingdom. Facilities are also afforded for transferring deposits from the old savings-banks to the post-office savings-banks, or *vice versa*. By the 31st March, 1862, there had been formed 2532 of these banks, and the deposits amounted to £735,253, from 81,965 depositors. At present the total amount of deposits exceeds £116,000,000, there being somewhere about 12,000 of these banks in all, and over 7,600,000 accounts remaining open. Of these accounts (representing individual depositors) over 6,600,000 belong to England and Wales, 305,000 to Scotland, and 323,000 to Ireland. In England and Wales the number of depositors is 1 in 5 of the population, and the average amount per depositor remaining due is nearly £16; in Scotland and Ireland the proportion is about 1 in 13 or 14, and the average in the former about £12, in the latter about £20. The smaller proportion of depositors in Scotland than in England is to be attributed to the greater facilities offered by the ordinary banks, to which the larger depositors have recourse. This also explains the low average per depositor in Scotland. The regulations regarding the purchase of government stock and government annuities correspond with those already given in connection with the trustee savings-banks. It is not allowable to have an account in both a post-office and a trustee savings-bank, nor to have more than one account in either.

BANKRUPT is derived generally from *It. banca*, a bench, and *Lat. ruptus*, broken, in allusion to the benches formerly used by the money-lenders in Italy, which were broken in case of their failure. There is perhaps no branch of legislation more difficult, and at the same time more important, than that which defines the relations of debtors and creditors. One of the first objects of all laws, after the protection of the person, is the enforcement of the obligation of contracts, and among all the contracts made in a community those imposing the obligation to pay money constitute the most numerous class. Some of the first questions in legislation are, By what measures shall this obligation be enforced? and by what penalties shall the breach of it be punished? In many communities, especially in the earlier stages

of civilization, the breach of such a contract or obligation is regarded as a crime, and the insolvent debtor treated as a criminal. The ancient laws upon this subject in England regard the insolvent trader in this light. The early laws of the Romans and Athenians authorized the most rigorous measures for procuring satisfaction of a debt; even permitting the sale of the debtor into slavery for this purpose. But as civilization advances the laws put a more mild construction upon the debtor's failure to fulfil his contract, and with certain qualifications and under certain restrictions attribute it to misfortune, and on his giving up his property to be divided among his creditors discharge him from all further liability.

Law of Bankruptcy in England.—Imprisonment for debt was abolished in 1869 (32 and 33 Vict., cap. lxxi.). The present law of bankruptcy in England is regulated mainly by the statute 46 and 47 Vict., cap. lii., known as the Bankruptcy Act, 1883, which was amended by the Bankruptcy Act, 1890 (53 and 54 Vict., cap. lxxi.). An essential feature under the act of 1883 is the intervention of the Board of Trade at all stages of the bankruptcy, with the object of obtaining full official supervision and control. By this act the distinction, so long preserved in matters of insolvency, between 'traders' and 'non-traders' is abolished. A bankruptcy petition may be presented either by a creditor or a debtor. A debtor's petition must allege his inability to pay his debts, and is in itself an act of bankruptcy. A creditor's petition must be founded on a liquidated debt of not less than fifty pounds, payable immediately, or at some certain future time, due to one or more creditors, and on an act of bankruptcy committed by the debtor within three months before the presentation of the petition, and on the fact that the debtor is domiciled in England, or has ordinarily resided, or had a dwelling-house or place of business in England within a year of such presentation. A debtor commits an act of bankruptcy in each of the following cases:—(a) If he makes a conveyance or assignment of his property to a trustee or trustees for the benefit of his creditors generally. (b) If he makes a fraudulent conveyance, gift, delivery, or transfer of his property or of any part thereof. (c) If he makes any conveyance or transfer of his property or any part thereof, or creates any charge thereon which would under the Bankruptcy Act, 1883, or any other act, be void as a fraudulent preference if he were adjudged bankrupt. (d) If, with intent to defraud or delay his creditors, he does any of the following things: namely, departs out of England, or being out of England, remains out of England, or departs from his dwelling-house, or otherwise absents himself, or begins to keep house. (e) If execution issued against him has been levied by seizure and sale of his goods under process in an action in any court or in any civil proceeding in the High Court of Justice. (f) If he files in the court a declaration of his inability to pay his debts, or presents a bankruptcy petition against himself. (g) If a creditor has obtained a final judgment against him for any amount, and execution thereon not having been stayed, has served on him a bankruptcy notice under the act requiring him to pay the judgment debt in accordance with the terms of the judgment, or to secure or compound for it, and he does not either comply with the requirements of the notice, or satisfy the court that he has a counterclaim, set off, or cross demand which equals or exceeds the amount of the judgment debt, and which he could not set up in the action in which the judgment was obtained. (h) If the debtor gives notice to any of his creditors that he has suspended, or that he is about to suspend, payment of his debts. By the act of 1883 the London Bankruptcy Court was united and consolidated with

the Supreme Court of Judicature, and its jurisdiction was transferred to the High Court of Justice. The county courts continue to have jurisdiction in bankruptcy for all parts of England outside the London bankruptcy district. When the petitioning creditor satisfies the court as to his debt, to the service of the petition, and to the alleged act of bankruptcy, a 'receiving order' is forthwith made against the debtor. The effect of a receiving order is to protect the debtor's estate by constituting the official receiver—an officer of the court appointed by the Board of Trade—receiver of the debtor's property, and to stay the remedies of all creditors in respect of any debts provable in bankruptcy until the meeting of creditors has been held. Within three days of the receiving order, if made on his own petition, or within seven days if made on the petition of a creditor, the debtor must make out a full statement of his affairs, verified on oath, setting forth his assets, debts, and liabilities, with names and addresses of his creditors, and accounting as best he can for his deficiency. The official receiver summons the meeting of creditors within fourteen days of the date of the receiving order, unless the court extends the time. A summary of the debtor's affairs with the causes of his failure is sent to each creditor along with the notice of the meeting, and the notice of the intended meeting is also advertised by the official receiver in the *London Gazette*. The creditors must send to the official receiver one clear day before the meeting sworn proofs of their claims to enable them to vote at the meeting. The provisions of the act as to proxies are very strict. All proxies must be deposited with the official receiver one clear day before the meeting. If it is desired to appoint a person, who is not in the regular employment of the creditor, to vote at the meeting of creditors, a special form of proxy must be obtained from the official receiver. The special proxy can only be given to any person to vote at any specified meeting or for against any specific resolution, or for or against any specified person as trustee. At the meeting of creditors the creditors (unless they pass a special resolution entitling the debtor's proposal for a composition or scheme) by ordinary resolution resolve that the debtor be adjudged bankrupt. They also appoint a trustee of the bankrupt's property, with a committee of inspection selected from amongst their body (not more than five, nor less than three persons) for the purpose of superintending the administration of the bankrupt's property by the trustee. The trustee proceeds to wind up the estate, and in due course divides the available realized assets equally amongst all those creditors who have sent in sworn proofs of their claims. The first dividend is to be declared within four months of the first meeting of creditors, and subsequent dividends, if any, at intervals of not more than six months. By the Bankruptcy Act, 1883, in the distribution of the bankrupt's property the following claims are paid in priority to all other debts, viz. parochial rates, assessments, taxes, land tax, property tax not exceeding one year's assessment, all wages or salary of a clerk, servant, labourer, or workman during four months before the date of the receiving order not exceeding £50. The trustee is required to give security to the satisfaction of the Board of Trade. His accounts are to be audited by the Board of Trade not less than twice in each year. All monies received by the trustee under the bankruptcy must be paid forthwith into the Bank of England, to an account kept here by the Board of Trade, called the 'Bankruptcy Estates Account.' Under very special circumstances, the trustee may obtain the authority of the Board of Trade to make use of a local bank. Every debtor is bound to be publicly examined upon oath in court

as to his conduct, and as to his statement of affairs. Any creditor, who has tendered a proof, or his representative, may take part in the examination of the debtor. Until the debtor has passed his public examination, he cannot apply for an order of discharge. The application for the order of discharge is heard in open court. The court is bound to take into consideration the report of the official receiver as to the bankrupt's conduct and affairs, and may either grant or refuse an absolute order for discharge, or suspend the operation of the order for a specified time, or grant the discharge on specified conditions. Upon proof of any of the following facts (apart from any misdemeanour) the court refuses or suspends the discharge:—(a) That the bankrupt has omitted to keep proper books of account to sufficiently disclose his financial position within the three years preceding his bankruptcy. (b) That the bankrupt has continued to trade, after knowing himself to be insolvent. (c) That the bankrupt has contracted any debt provable in the bankruptcy without having at the time of contracting it any reasonable ground of being able to pay it. (d) That the bankrupt has brought on his bankruptcy by rash and hazardous speculations or unjustifiable extravagant living. (e) That the bankrupt has put any of his creditors to unnecessary expense by a vexatious defence to any action properly brought against him. (f) That the bankrupt has within three months preceding the date of the receiving order, when unable to pay his debts as they become due, given an undue preference to any of his creditors. (g) That the bankrupt has previously been adjudged bankrupt or compounded with his creditors. (h) That the bankrupt has been guilty of any fraud or fraudulent breach of trust. A discharged bankrupt is disqualified from sitting in the House of Lords or House of Commons, from acting as a justice of the peace, as a mayor, an alderman, or an overseer of the poor, or as a member of a county council, school-board, &c., for a period of five years. An undischarged bankrupt obtaining credit to the extent of £20 or upwards from any person, without informing such person of his status, is guilty of a misdemeanour. By section 18 of the Bankruptcy Act, 1883, the creditors may at the first meeting by special resolution resolve to entertain a proposal for a composition in satisfaction of the debts due to them, or a proposal for a scheme of arrangement of the debtor's affairs. The composition or scheme shall not be binding on the creditors, unless it is confirmed by a resolution passed at a second meeting by a majority in number representing three-fourths in value of all the creditors who have proved. After the creditors have confirmed the composition or scheme, it has to be formally brought before the court for approval, and, if the court is of opinion that the proposal is not reasonable, the court may refuse to sanction the composition or scheme. By section 23 of the act a composition or scheme may be sanctioned by the court after the debtor's adjudication as a bankrupt, and in this case the bankruptcy is annulled. Fraudulent debtors are brought within the provisions of the Debtor's Act, 1869, by virtue of the terms of the Bankruptcy Act, 1883; and when the court having jurisdiction in bankruptcy orders a prosecution for any offence under the Debtor's Act, 1869, or for any offence arising out of any bankruptcy proceedings, it is the duty of the public prosecutor to carry on the prosecution. By section 125 of the Bankruptcy Act, 1883, the estates of persons dying insolvent may be administered according to the law of bankruptcy, but an order of administration under this section shall not be made until the expiration of two months from the date of the grant of probate or letters of administration.

Law of Bankruptcy in Scotland.—The regulating statute at present is 19 and 20 Vict. cap. lxxix. (1856), taken along with several subsequent acts. According to Scots law bankruptcy is notorious insolvency, that is a public acknowledgment of inability to discharge obligations, such inability being manifested in manner defined by statute and corresponding pretty nearly to the 'acts of bankruptcy' in English law. By a judicial proceeding, called *sequestration*, authorized to be issued by the Court of Session, or sheriff court, on the petition of the debtor himself with the concurrence of one creditor swearing to a debt of £50, two whose debts together amount to £70, or of any number of creditors whose debts together amount to £100; or on the petition of a creditor or creditors to the foregoing extent without the concurrence of the debtor, provided the debtor has clearly shown himself to be insolvent (or a *notour bankrupt*), as by allowing his effects to be arrested for debt; the whole estate and effects of the debtor, real and personal, are sequestered or legally taken from the power of the debtor for behoof of the creditors. The debtor's estate is then made over to a trustee as soon as the creditors can meet and choose a fit person; the trustee, when chosen, having power to deal with the whole property assigned him, and to recover, for the benefit of the creditors, all property and effects made over to confidential persons after insolvency, or conveyed to creditors in satisfaction or security of previous debts within sixty days before sequestration or constitution of notour bankruptcy. The trustee's duty is to bring the whole estate into the form of money, with certain precautions; to receive and investigate the claims of the creditors, and to reject or admit them, subject to review of the Court of Session or sheriff court by summary petition. At certain appointed times he is required to make successive dividends to the creditors ranked according to their rights and interests, till the whole funds shall be exhausted. The debtor, his family, and all others who can give information as to the estate, must submit to public examination on oath before the sheriff of the county, and the debtor may thereafter, or by petition after six, twelve, or eighteen months from sequestration, be discharged of all debts by the court with consent of the creditors or a number of them, or at the expiry of two years without consent. These proceedings may be partly superseded by 'composition' if such be assented to by a majority in number and nine-tenths in value of creditors, or by a majority in number and four-fifths in value of the creditors, according to the period at which such arrangement may be proposed. They may also be terminated by a deed of arrangement entered into between the bankrupt and a majority in number and four-fifths in value of his creditors, approved of by the court. If an offer of composition has been rejected by the creditors another offer cannot be accepted unless by the consent of nine-tenths of the creditors in value. In the case of a composition the bankrupt undertakes to pay a certain proportion of his debts, the proportion being arranged between him, his creditors, and the court, and he then gets his discharge. Discharge may be refused even at the end of the two years above mentioned if a dividend of 5s. per £ has not been paid or secured; but this does not hold good if the failing to pay such dividend is owing to any cause for which the bankrupt cannot be held responsible. Before a discharge is given there must be a report from the trustee as to the conduct of the bankrupt, whether he has complied with the provisions of the act, has made a fair surrender of his estate, has attended the diets of examination, has become bankrupt from misfortunes or through culpable and undue conduct, &c. Before

the abolition of imprisonment for ordinary civil debts by act passed in 1880, an insolvent debtor often took advantage of a form of process known as *cessio bonorum*, carried out before the Court of Session or a sheriff, by means of which, on making a complete *cessio bonorum*, or surrender to his creditors of all his property, he could obtain protection from imprisonment, the court having power to judge of his right to such protection, and to prolong his imprisonment, or rather to refuse him protection, according to his conduct. This process is still to some extent available, but no person can now be imprisoned for debt unless it consist in unpaid taxes, fines or penalties due to the crown, assessments lawfully imposed, or sums deemed for alimony. A creditor of a notour bankrupt may present a petition to the sheriff representing that the debtor is unable to pay his debts, and praying the sheriff to decree that he shall assign over all his goods for behoof of his creditors and that a trustee be appointed, and this proceeding is now designated a process of *cessio bonorum*. A debtor against whom decree of *cessio* has been pronounced, on the expiration of six months may apply to the sheriff for a final discharge of all debts before the date of such decree, and subsequently at twelve and eighteen months or two years as in sequestration. If the liabilities of the debtor exceed £200 the sheriff may award sequestration if he see fit. The act of 1880 also provides for the better punishment of fraudulent debtors in Scotland.

In *Ireland* there is a special code of bankruptcy contained in special acts, differing to some extent from the regulations prevailing both in England and Scotland. Bankruptcy business comes before the special court in Dublin or local courts. Imprisonment for debt was abolished in 1872.

BANKS, SIR JOSEPH, Baronet, a distinguished naturalist, was born in London, 4th January, 1743. He was descended from an ancient Yorkshire family settled in Lincolnshire. At nine years of age he was sent to Harrow, and at thirteen or fourteen removed to Eton. His tutor describes him at this time as immoderately fond of play. He went to Oxford in December, 1760. Here he began to manifest a strong love of botany and other branches of natural history, to which his attention had already been turned from about the age of fourteen. He formed a volunteer class in the university, and brought Mr. Lyons from Cambridge to teach it. He left Oxford in December, 1763, after having taken an honorary degree. His father having died previously, he came into possession of the paternal property on coming of age in January, 1764. In May, 1766, he was chosen a member of the Royal Society, and in summer he went to Newfoundland and proceeded to Hudson's Bay to collect plants. After his return in winter an intimacy commenced between him and Dr. Solander, a Swedish gentleman and pupil of Linnæus, then assistant-librarian at the British Museum. In 1768 he, together with his friend Dr. Solander, accompanied Cook on his voyage of discovery, Banks being appointed naturalist to the expedition. In an expedition into the interior of the desolate Tierra del Fuego, for the purpose of examining the country, the two naturalists narrowly escaped perishing with cold. Banks procured the introduction of the bread-fruit tree into the West Indies, and he wrote the botanical observations in the account of Cook's voyages. In 1771 the University of Oxford conferred on him the degree of Doctor of Laws. In 1772 he visited Iceland along with Dr. Solander, in order to make himself acquainted with its natural productions. During this voyage the Hebrides were examined, and the columnar stratification of the rocks surrounding the caves of Staffa made known for the first time to naturalists. After the resignation of Sir

John Pringle in 1777 Banks was chosen president of the Royal Society. In 1779 he married Dorothea, eldest daughter of William Western Huggess, Esq., of Provender, Kent. In 1781 he was made a baronet. In 1795 he received the order of the Bath. The French chose him a member of the National Institute in 1802, because to his intercession they owed the recovery of the papers of La Peyrouse relating to his voyage, which had fallen into the hands of the British. His library and his collections in natural history are celebrated. Besides some essays, periodical publications, and some contributions to the transactions of learned societies, he wrote nothing but a *Short Account of the Causes of the Blight, the Mildew, and the Rust in Corn*, 1805. He died June 19, 1820. In accordance with a contingent bequest, his collections were added to the British Museum. The genus *Banksia* of the natural order Proteaceæ, was named in honour of him by the younger Linneus.

BANKS, THOMAS, an English sculptor, was born in Lambeth on Dec. 29th, 1735. He studied sculpture with great success in the Royal Academy, and was elected to be sent, as one of its students, to Italy. Here he executed several excellent pieces, particularly a bass-relief representing Caractacus and his Family before Claudius, and a Cupid catching a butterfly, which was afterwards purchased by the Empress Catharine. From Italy he repaired to Russia, where he stayed for two years without meeting with any adequate encouragement, when he returned to his own country. Among other works executed by him was a colossal statue, exhibiting Achilles enraged for the loss of Briseis, now in the entrance hall of the Royal Academy. He was also the sculptor of the admired monument of Sir Eyre Coote in Westminster Abbey, and of those of Dr. Watts, and Woollett. His diploma work was a figure of a Falling Titan. Banks was elected a member of the Royal Academy in 1785, not long after his return from Russia, and finished a life of arduous exertion on 2nd February, 1805.

BANN, UPPER and LOWER, two rivers in the N. of Ireland. The first rises in the mountains of Mourne, county Down, about 8 miles E. of Newry. After flowing a distance of 38 miles in a N. direction past Banbridge and Portadown, it falls into Lough Neagh, near the Banfoot Ferry, in county Armagh.—The Lower Bann is the outlet of Lough Neagh. It flows past Toome, and expands into Lough Beg, winding through a rugged country, forming during most of its course the boundary of the two counties; passing Coleraine, it falls into the Atlantic Ocean 4 miles below that town, after a course of nearly 40 miles. It is navigable for vessels of 200 tons to Coleraine.

BANNATYNE CLUB, a literary society instituted in Edinburgh in 1823 by Sir Walter Scott (its first president), David Laing (secretary till its dissolution in 1861), Archibald Constable, and Thomas Thomson. It started with thirty-one members, having the intention of printing rare works on Scotch history, literature, geography, &c. The membership was subsequently extended to 100, the most eminent of Scotchmen eagerly seeking admission. It derived its name from George Bannatyne, to whose efforts we are indebted for the preservation of much of the Scottish poetry of the fifteenth and sixteenth centuries. The last of its volumes appeared in 1867.

BANNER, a flag or standard, especially a square flag bearing some heraldic device. Formerly it was a flag borne by a banneret and charged with his coat-of-arms. It differed from a pennon in being square instead of pointed, and its size varied according to the rank of the bearer. The banner of a knight served as a rallying-point for his retainers. A knight-bachelor was formerly created a banneret for

special gallantry in the field by cutting off the points of his pennon. The dignity of banneret was not hereditary.

BANNOCKBURN, a village of Scotland, in Stirlingshire, 2 miles S.E. Stirling, famous for the decisive battle fought near it between King Robert Bruce of Scotland and Edward II. of England, on the 24th June, 1314, in which the English, though greatly superior in numbers and equipment, were defeated. The Scots owed their signal success partly to their position and partly to the use of covered pits which rendered the English cavalry useless. The Borestone where Bruce is said to have planted his standard, is still shown near a flag-staff erected in 1870. The village has manufactures of woollens, such as tartans, carpets, &c.; and a population in 1891, of 2000.

BANQUETTE, in fortification, the elevation of earth behind a parapet, on which the garrison of a fortress may stand, on the approach of an enemy, in order to fire upon them. The height of the parapet above the banquette (the height of defence) is usually about 4 feet 6 inches; the breadth of the banquette, when it is occupied by one rank, 2½ to 3 feet; when it is occupied by two ranks, 4 to 6 feet. It is frequently made double; that is, a second is made still lower.

BANS, or BANNS OF MATRIMONY, the public notice or proclamation of a matrimonial contract, and the intended celebration of the marriage of the parties in pursuance of such contract, to the end that persons objecting, either on account of kindred, precontract, or for other just cause, may have opportunity to declare such objections before the marriage is solemnized. The notice is given either by proclamation, *viva voce*, by a minister or some public officer thereto authorized, in some religious or other public assembly, or by posting up written notice in some public place. In England an episcopal license may be obtained by those wishing to dispense with the proclamation of bans. A marriage celebrated without the proclamation of bans, or the publication of notice, or the obtaining of a license, is void; but in Scotland it is valid. See MARRIAGE.

BANTAM, or BATAN, a province occupying the whole of the W. end of the island of Java, and containing a pop. of about 520,000. It long formed an independent kingdom governed by its own sultan, but at the beginning of the nineteenth century was formally incorporated by the Dutch with their other possessions. Though not so fertile as the adjoining provinces, it grows large quantities of rice, which is now the staple product. Its capital, which bears the same name, was once the principal mart of the Dutch, and was surpassed by few towns of the East in antiquity and celebrity. It is now very much decayed. Bantam is believed to give name to the well-known small, but spirited breed of domestic fowl.

BANTRY, a seaport town in Ireland, county Cork, at the head of Bantry harbour, near the N. end of Bantry Bay, E. side, 56 miles W.S.W. of Cork. It consists of four principal streets and a spacious square. It is irregularly and indifferently paved, and has some good houses, but the greater portion poor, the town having altogether a mean appearance. It contains places of worship for Episcopalians, Roman Catholics, and Wesleyans. It has a growing trade, and contains a woollen mill, a paint factory, and a butter factory. Fishing is carried on to some extent. The scenery around Bantry is highly picturesque. Pop. in 1891, 2921.—The bay, remarkable at once for its natural beauties and its natural advantages, although the latter are turned to but little account, is large, safe, and commodious for vessels of any size. The water is deep close to both shores, no rocks or

shoals in the way but such as may be easily avoided, and the stream of tide is scarcely sensible in any part of it. The points of land forming the entrance into Bantry Bay are Crow Head on the N.W., and Sheep's Head on the S.E.

BANKRINGS (Tupalææ), a genus of quadrupeds, belonging to the Insectivora, inhabiting the Indian Archipelago, bear some resemblance externally to squirrels, but are easily distinguished by their long pointed snout. They are covered with soft and glistening hair, have a long bushy tail, and live among trees, which they ascend with great agility.

BANYAN, or **BANIAN**, a tree in India, the *Ficus indica* of naturalists. The most peculiar feature of this tree is the property which it possesses of throwing out supports from the horizontal branches, which take root as soon as they reach the ground, enlarge into trunks, and extending branches in their turn, soon cover a prodigious extent of ground. On the banks of the Nerbudda is a celebrated banyan-tree which has been known to shelter 7000 men beneath its shade. Much of it has been swept away by high floods; but what still remains is near 2000 feet in circumference, measured round the principal stems, so that the overhanging branches cover a much larger space.

BANYA, **NAGR**—(ancient *Rivuli Dominarum*), a royal free town in Hungary, county of Szathmar, 93 miles E. of Debrecsin, and not far from the borders of Transylvania. It is the centre of a mining district, mines having been worked here since the fourteenth century, and the produce consisting of gold, silver, lead, and copper. In the town the chief industrial products are spirits, cotton and linen goods, pottery ware, enamelled tiles, &c.; and there is an active trade. Four yearly markets are held here. Pop. (1900), 11,183.

BAOBAB (*Adansonia digitata*), a tree belonging to the natural order (or sub-order) Bombacææ, and forming the only known species of its genus, which was named after the naturalist Adanson. It is also called the monkey-bread tree. The leaves are deep green, and are divided into five unequal parts radiating from a common centre, and each lanceolate in shape. This tree is a native of Western Africa, and is likewise said to be found in Egypt and Abyssinia; it is cultivated in many of the warmer parts of the world. It is one of the largest known trees, its trunk being sometimes not less than 30 feet in diameter. In Adanson's account of Senegal some calculations are made regarding the growth of this tree founded on the evidences of the annular layers. The height of its trunk by no means corresponds with the thickness which it attains. Thus, according to his calculations, at one year old its diameter is 1 inch, and its height 5 inches; at thirty years old it has attained a diameter of 2 feet, while its height is only 22 feet, and so on; till at 1000 years old the baobab is 14 feet broad, and 58 feet high; and at 5000 years the growth laterally has so outstripped its perpendicular height that the trunk will be 30 feet in diameter, and only 73 feet high. The roots again are of a most extraordinary length, so that in a tree with a stem 77 feet in girth the main branch or tap-root measures 110 feet in length. It often happens that the profusion of leaves and of drooping boughs almost hide the stem, and the whole forms a hemispherical mass of verdure 140 to 160 feet in diameter, and 60 to 70 feet high. The wood is pale-coloured, light, and soft, so that in Abyssinia the wild bees perforate it and lodge their honey in the hollow, which honey is considered the best in the country. The negroes on the western coast again apply their trunks to a very extraordinary purpose. The tree is liable to be attacked by a fungus which, vegetating in the woody part without

changing the colour or appearance, destroys life, and renders the part so attacked as soft as the pith of trees in general. Such trunks are then hollowed into chambers, and within these are suspended the dead bodies of those to whom are refused the honour of burial. There they become mummies, perfectly dry, and well preserved, without further preparation or embalming, and are known by the name of *giuriots*. The baobab is emollient and mucilaginous; the pulverized leaves constitute *lalo*, a favourite article with the natives, which they mix with their daily food to diminish excessive perspiration, and which is even used by Europeans in fevers and diarrhæas. The flowers are large, white, and handsome; and in their first expansion bear some resemblance to the white poppy, having snow-white petals and violet-coloured stamens. Both flowers and fruit are pendant, and the leaves drop off before the periodical rains come on. The fruit is of an oblong shape, of considerable size, and tastes like ginger-bread, with a pleasant acid flavour. The expressed juice, when mixed with sugar, forms a cooling drink, much used in putrid fevers: this juice also is generally used as a seasoning for corn-gruel and other food.

BAPTISM. As most symbolical ceremonies originate from customs or events of common life, which are afterwards chosen to represent something higher, baptism originated from the bathings and ablutions so frequently practised in Asia, and which, among all the sects of that part of the world, whether heathens, Jews, or Mohammedans, have obtained a religious character. Baptism (from the Greek *baptizo*, to baptize, originally to dip in water, from *bapto*, to immerse or dip) is generally thought to have been usual with the Jews even before Christ, and every converted heathen was probably not only circumcised, but also washed, as a symbol of his entrance into the new religion purified from the stains of his former life. From this baptism of proselytes, however, that of St. John the Baptist differed, because he baptized Jews also as a symbol of the necessity of perfect purification from sin. And the baptism of John was closely connected with his preaching and with the acceptance of his call to repentance, and declaration of the coming of the one who had sent him. Jesus himself was baptized by John, as were probably several of his apostles, who had been disciples of St. John. Christ himself never baptized, but directing his disciples to administer this rite to the converts, used the words: 'Go ye, therefore, and teach all nations, baptizing them in the name of the Father, and of the Son, and of the Holy Ghost' (Mat. xxviii. 19). Baptism, therefore, became a religious ceremony among Christians, and is considered as a sacrament by all sects which acknowledge sacraments. In the primitive church the form of baptism was very simple. The person to be baptized was dipped in a river or in a vessel, with the words which Christ had ordered, and to express more fully his change of character, generally adopted a new name. The immersion of the whole body was omitted only in the case of the sick who could not leave their beds. In this case sprinkling was substituted, which was called *clinic baptism*. The Greek Church, as well as the schismatics in the East, retained the custom of immersing the whole body; but the Western Church adopted or allowed, at different times in different countries, the mode of baptism by pouring or sprinkling, which has been continued by the Protestants, the Baptists only excepted. The introduction of this mode of baptism was owing to the great inconvenience which arose from the immersion of the whole body in the northern climates of Europe. Baptism is the rite of admission to the Christian Church, and most Christians have thought that after the analogy of cir-

circumcision in the Old Testament it ought to be administered to the infant children of believers. This practice can be traced back certainly to the third century, before which its existence is disputed by some, and our information is scanty. The idea which early crept in of a power in this sacrament to procure perfect remission of sins led in many cases to a delay of baptism till the approach of death, but on the other hand the doctrine that the unbaptized were irrevocably damned changed this delay into haste, and made early baptism become general. The death of a martyr, however, who perished while yet a catechumen, was accounted equally effectual for salvation with baptism. This was called *baptisma sanguinis* (baptism of blood). Being an initiatory rite, baptism is only administered once to the same person; and, after some discussion in the third and fourth centuries, it was established as the rule of the church that the baptism even of heretics is valid, provided it be administered in the name of the Trinity. This rule is still recognized by all sects of Christians. The Roman and Greek Catholics consecrate the water of baptism, but Protestants generally do not. Exorcism (which see) is not abolished in all Protestant countries. The act of baptism is accompanied only with the formula that the person is baptized in the name of the Father, Son, and Holy Ghost; but this act, among most Christians, is preceded by a confession of faith made by the person to be baptized if he be an adult, and by his parents or sponsors if he be a child. Even in the ancient church every person, when baptized, was attended by a Christian friend of the same sex, who became responsible for the faith of the new Christian, and promised to take care of his spiritual welfare. The form still remains, though the promise is not very strictly complied with in most cases. The baptismal ceremonies used in the Roman Catholic church are as follows: 'The priest meets the child at the door of the church; drives the devil from him; breathes thrice upon his face, to signify the new spiritual life which is to be breathed into his soul; puts salt into his mouth, as a sign that he is to be free from the corruption of sin; signs him on the forehead and breast with the sign of the cross, and leads him into the temple of God. Then the priest solemnly exorcises the child; anoints his ears and nostrils with spittle—after our Lord's example, who thus restored the blind man's sight—and asks him in three separate interrogations whether he renounces Satan, all his works and all his pomps. He next anoints him with the oil of catechumens on the breast and between the shoulders. . . . The recipient then through his sponsors professes his faith by reciting the Creed, and the priest pours water three times on his head in the form of a cross, at the same time pronouncing the words, "I baptize thee", &c. After baptism, chrism is put on the top of his head to signify his union with Christ the head of his Church; he receives a white garment, and a burning light in his hands, symbols of innocence, and of the light of faith and charity.' (Addis and Arnold's Catholic Dictionary.) Protestants reject these ceremonies as unwarranted additions to the ordinance of Christ. The Roman Catholic Church acknowledges three kinds of baptism, that of water, fire, and blood (*baptisma fluminis, flammæ, sanguinis*). The first is the common one; the second is perfect love of God, connected with a sincere and ardent desire to be baptized; the third is the martyrdom of a catechumen for the Christian faith. All three are equal in their effect. This church acknowledges that all persons not baptized are shut out from heaven, but infants, at least, are not condemned to suffering. Most Protestants hold that though the neglect or contempt of the sacrament is a grievous sin, yet it is not the mere

want of it that excludes any, either infants or adults, from heaven, but only the want of the new birth that is symbolized by baptism. Naming the person baptized forms no essential part of the ceremony, but has become universal, probably from the ancient custom of renaming the catechumen.

The word has been used in various figurative senses, as in the phrase *baptism by fire*, used by John the Baptist, which has given rise to much conjecture. The generality of the fathers hold that believers, before they enter paradise, must pass through a certain fire, which is to purify them from all pollutions remaining unexpiated. But some, with St. Basil, understand it of the fire of hell; others of that of tribulation and temptation; while a few will have it, with St. Chrysostom, to denote abundance of graces. Some suppose it to mean the descent of the Holy Ghost on the Apostles in the form of fiery tongues; others maintain that the word *fire* is an interpolation, and that the true reading of the text is, 'He shall baptize you with the Holy Ghost'.

Tertullian gave the name *baptism of blood* to martyrdom before baptism, and to the death of martyrs in general, which he, and after him other Christian fathers, considered as another and more effectual baptism for purification from sins, and urgently recommended to believers.

BAPTIST, JOHN GASPAR, born at Antwerp, came to England during the civil war, and served under Lambert. He had in early life studied painting under Bochaert, and after the restoration returned to his profession, and was often employed by Sir Peter Lely in painting draperies and backgrounds, and occasionally for similar purposes by Kneller. His skill was chiefly displayed in designs for tapestries. He died in 1691.

BAPTISTERY, literally the place where the ceremony of baptism is performed, but generally denoting a separate building distinct from the church, as used for this purpose. The most celebrated baptisteries are those of Florence and Pisa, belonging to the respective cathedrals of these cities.

BAPTISTS, a Protestant sect, distinguished by their opinions respecting the mode and subjects of baptism. With regard to the former, they maintain the necessity of immersion, from the signification of the word *baptizein*, to dip, used by the sacred writers; from the performance of the rite in rivers in the primitive ages, and from the phraseology used in describing the ceremony. With regard to the subjects, they consider that baptism ought not to be administered to children nor infants at all, nor to adults in general, but to those only who profess repentance and faith. This they defend from the language of scripture, 'Repent, and be baptized', &c., and from the existence of catechumens in the ancient churches, who were instructed before they were baptized. They are sometimes called *Anti-pædobaptists*, to express their variance from those who defend infant baptism, and who are called *Pædobaptists*. The peculiar sentiments of this denomination have spread so much among other sects that we find Baptists equally among Calvinists and Arminians, Trinitarians and Unitarians. The Baptists of all descriptions adopt the Independent or Congregational form of church government, and all their ecclesiastical assemblies disclaim any right to interfere with the concerns of individual churches. The meetings of the members of different congregations are held for the purpose of mutual advice, and not for the general government of the whole body.

The Particular Baptists of England, the Baptists of Scotland and Ireland, the Associated Baptists of America, and some of the Seventh-day Baptists, are Calvinistic. The other classes are Arminian, or at

least not Calvinistic. All, except some of the Christian Society, are Trinitarians. The Free-will Baptists, the Christian Society, and some of the General Baptists of England, admit of open communion; the other bodies decline communion with any Christians but Baptists. Among the principal divisions are the Particular Baptists, who adopt the doctrine of particular election; and the General Baptists, who profess the doctrine of universal redemption. Some of the churches of the latter have three orders, separately ordained—messengers, elders, and deacons. The Associated or Calvinistic Baptists have made very great progress in the United States, where they long ranked as the most numerous denomination of Christians, though they appear now to be outstripped by the Methodists, especially if the latter are considered as one great sect, and not rather as a mere aggregate of different sects. The Seventh-day Baptists, or Sabbatarians, observe the seventh day of the week. The Free-will Baptists profess the doctrine of free salvation. The first church of this order was gathered in New Hampshire (United States) in 1780. The Christian Society is Anti-Calvinistic and Anti-Trinitarian. The first church was founded in 1803 in Portsmouth, N. H. Their churches have organized the General Christian Conference. They profess to reject useless forms and ceremonies, to use scriptural expressions, and disclaim all creeds and articles of faith. The 'Tunkers', a branch of the German Baptists, are distinguished for their simplicity of dress and manners, and for wearing beards. Tunker is a popular term for this body not recognized by themselves.

At an early period of the Reformation the subject of infant baptism was discussed. The Anabaptists of this period are not, however, to be confounded with the Baptists, by whom their principles were expressly disclaimed. The persecution of Dissenters in the reign of Elizabeth gave rise to the foundation of the first regular church of this sect, though their principles had prevailed much earlier. We may date the first public acknowledgment of the Baptists as distinct from the Anabaptists from their petition to Parliament in 1620. In 1623 they are described as carrying an external appearance of holiness, as denying the doctrines of predestination, reprobation, &c. It is therefore probable that the Baptists of that time were General Baptists. The year 1633 provides us with the earliest records remaining of the formation of a Particular Baptist church in London. Between these two denominations there never has been much intercourse. Both of them have repeatedly and publicly disclaimed Anabaptism. The Particular Baptists have never had any material dispute amongst their members, except upon a point agitated also amongst the General Baptists—that of mixed communion: the question is, whether persons baptized in infancy and not rebaptized at full age may be admitted to the communion-table in their congregations. The Baptist Union formed in 1832 comprehends the greater number of members of this sect in Great Britain and Ireland. The number of chapels in the United Kingdom, associated and unassociated, in 1897 was 3842; ministers, 2006; members, 364,779; Sunday scholars, 527,616. The number of Regular Baptists in the United States in 1890 was about 3,000,000; in addition to which there were Anti-Mission Baptists, Free-will Baptists, and Seventh-day Baptists. See also ANABAPTIST and MISSION.

BAR, a word used in several technical senses, one of which is that of the partition running across a court of law, within which only solicitors, king's counsel, barristers with patents of precedence, and parties appearing in person are admitted. All other barristers and members of the public are required to

stand behind the bar. Hence the phrase, *at the bar of the court*, that is, in open court. Hence also persons duly admitted as pleaders or advocates before the higher courts of England and Ireland, are denominated *barristers*, and the whole body of such barristers or advocates are called *the bar*. 'To be called to the bar' is to be admitted as a barrister, such admission being granted only to those who have kept a certain number of terms in one of the Inns of Court and passed certain examinations. (See BARRISTER, INNS OF COURT.) The *Bar Committee* is a body elected from the whole of the English bar to watch over the interests of barristers. It came into existence in 1883, and now consists of fifty members, namely the Attorney-General, the Solicitor-General, and forty-eight practising barristers, of whom at least twelve must be king's counsel and twenty-four outer-barristers. Each member holds office for three years, one-third retiring annually. The inclosed place or dock in which persons accused of crimes stand in court is also called the bar, and from this meaning of the word is derived the phrase, 'at the bar of public opinion'. Near the door of both houses of Parliament there is also a bar, beyond which none but the members and clerks are admitted.—BAR, in music, is a line drawn through the stave to mark the rhythm of small portions; the notes composing these are also called a bar.—BAR, in heraldry, denotes an ordinary resembling the fesse. See HERALDRY.

BARABINSKI, a tribe of Tartars, who seem to derive their name from the Baraba desert. They live on the banks of the river Irtysh, and are engaged in pastoral and agricultural pursuits. Their religion is Shamanistic, but Christianity has made some progress amongst them.

BARABOO, a city of the United States, capital of Sank county, Wisconsin, beautifully situated on the Baraboo river, about 40 miles N.W. of Madison. It is surrounded by splendid scenery, and stands in a fruit-producing district. The river is here crossed by three fine iron bridges. Pop. (1890), 4605.

BARACOA, a small seaport of Cuba, situated on the north coast of the extreme east end of the island. It was founded early in the sixteenth century, and is therefore one of the oldest towns in Cuba.

BARADA, the Abana of the Bible, a river of Syria, rising in the Anti-Libanus, leaving the mountains by a splendid ravine, and flowing across the plain to the east past Damascus. It loses itself in a lake called Bahret-el-Ateibeh. Round Damascus its waters are used for irrigation by means of canals.

BARAGUEY-D'HILLIERS, Louis, a distinguished French general under the empire, born in Paris 1764, died in Berlin Dec. 1812. In 1791 he was a lieutenant in the regiment of Alsace, and gave in his demission in order not to serve the revolution. He took service again soon afterwards, and became successively aide-de-camp to Generals Clillon, Labourdonnaue, and Custine. On the fall of the last-mentioned he was not employed again till 1795. He served in the army of Italy and took Berganio and Venice. Of the latter Napoleon appointed him governor, which post he retained till the surrender of the city to the Austrians. He took part in the expedition to Egypt, and was taken prisoner by the English when returning home with the spoils of Malta. After serving in the campaigns in Germany and Spain he accompanied Napoleon to Russia, commanded a division of the great army, and was intrusted with the direction of the vanguard in the retreat. Being surrounded by several corps of the enemy, he had to capitulate. Napoleon treated him harshly, and ordered an inquiry into his conduct. In the meantime he was ordered to return to France as under

arrest, but, overcome with grief and fatigue, he died at Berlin on the way.—His son, ACHILLE, COMTE BARAGNEY-D'HILLIERS (1795-1878), also distinguished himself as a general, and became marshal of France.

BARANZANO, JEAN ANTOINE, surnamed **REDUMPTUS**, a learned ecclesiastic of Piedmont, born about 1590. He became professor of mathematics at Annecy, corresponded with Lord Bacon, and wrote, among others, a work entitled *Uranoscopia* (1617). He died in 1622.

BARATIER, JEAN PHILIPPE, born at Schwabach, in the margraviate of Anspach, in 1721, showed a remarkable precocity of genius, and a kind of universal talent. At the age of four he spoke German, French, and Latin, shortly after learned Greek and Hebrew with equal facility, and at seven could repeat the Hebrew Psalter. He afterwards read several rabbinical books, and in his fourteenth year published a translation of the Itinerary of Benjamin de Tudela, in two vols. 8vo. He afterwards mastered mathematics, geography, astronomy, and almost every branch of knowledge; and was received as a member of the Royal Society of Prussia, and assisted in his studies by the king of Prussia. All these acquirements were made before he was nineteen. He died at Halle on Sept. 5th, 1740.

BARB. See **HORSE**.

BARBADOS, one of the Caribbees, and the most eastern of the West India Islands, supposed to have been discovered by the Portuguese, but belonging to the British, and settled by them in 1626. It lies about 78 miles eastward from St. Vincent and St. Lucia, lon. 59° 30' w.; lat. 13° 10' n. It is 21 miles long and 13 broad, containing 166 square miles, or 106,470 acres, most of which is under cultivation. It is divided into eleven parishes, and contains two towns, viz. Bridgetown, the capital (pop. 21,000), and Speight's Town. It is now more densely peopled than almost any spot in the world, the population being returned by the census of 1891 at 182,306, or about 1200 to the square mile. About six-sevenths of the population belong to the Church of England, the Wesleyans coming next with about 15,000 members. In 1896 the number of schools under the government was 185 primary, 5 second-grade, 3 first-grade; and above these is Codrington College, affiliated to the University of Durham. Barbados is the head-quarters of European troops in the West Indies, and has a garrison of about 850. The climate is very hot, but the air is pure, and moderated by the constant trade-winds. It is subject, however, to dreadful hurricanes, which do enormous damage to life and property. The surface is much diversified and is often picturesque, presenting valleys, hills, table-lands, cliffs, gorges, and ravines, some of the latter exhibiting perpendicular walls of 150 feet. The highest point of the island is Mount Hillaby, 1145 feet above the sea-level. There are now no woods or forests in Barbados, these having been all cut down to make way for agricultural operations. The indigenous mammals comprise the Barbados monkey, the raccoon, a species of mouse, and two species of bats. The list of birds is also meagre. The soil in the lowlands is black, somewhat gummy in the shallow parts, on the hills of a chalky marl, and near the sea generally sandy. Of these varieties of soil, the black mould is best suited to the cultivation of the sugar-cane, and with the aid of manure has given as great returns of sugar in favourable seasons as any in the West Indies, the prime lands of St. Christopher's perhaps excepted. Barbados has become of great importance as the place where the Intercolonial steamers meet the Ocean steamers from England, and tranship goods and passengers for the various

West India Islands. The principal article exported is sugar, next to which come molasses and rum. Depending on the rainfall, the sugar crop is liable to great fluctuations, and lately the industry has been greatly depressed owing to the competition of beet-sugar and the system of bounties practised by several of the European countries. The total exports have latterly varied from about £800,000 to over £700,000 annually, the imports being about £1,000,000. There are 24 miles of railway. Bridgetown is the port.

BARBADOS CHERRY, a West Indian name for the fruit of two trees of the genus *Malpighia*, much cultivated there. They are *M. urens* and *M. glabra*, and belong to the order Malpighiaceae.

BARBADOS GOOSEBERRY, the fruit of *Pereskia aculeata*, a West Indian cactus. It is yellow in colour and pleasant to the taste, and is used for making preserves.

BARBADOS LEG, a name for the disease otherwise known as elephantiasis (which see).

BARBADOS TAR, a commercial name for a sort of petroleum occurring in some of the West India Islands.

BARBARA, St., a virgin who suffered martyrdom at Nicomedia in the third century. Her father Dioscorus, on hearing of her conversion to Christianity, and on learning that she refused a certain advantageous offer of marriage, denounced her to the governor as a Christian. She was submitted to the most exquisite torture, having her breasts cut off and being led naked through the town, but she remained steadfast. Finally her unnatural father offered to put her to death, but no sooner had he beheaded her than he was struck dead by lightning. Hence St. Barbara is regarded as a protectress against lightning and storm, and she is also the patron saint of artillery. Her day is Dec. 4th.

BARBARELLI. See **GIORGIONE**.

BARBARIAN. The Greeks gave the name *barbaros* to every one who spoke a foreign language; and as the civilization of Greece was really much higher than that of the surrounding nations, the idea of rude, illiterate, uncivilized, soon connected itself with the word. The Romans in this, as in many other cases, imitated the Greeks, and applied the term *barbarus* to all nations except themselves and the Greeks—the two most civilized states of antiquity. This word, however, did not necessarily convey the idea of something odious; thus Plautus calls *Nævius barbarum poetam*, because he had not written in Greek. Cicero uses the word *barbari* in reference to illiterate persons without taste; and we still apply the term *barbarism* to an expression which offends the rules of a language. The signification of cruelty, implied in the word, is of modern origin.

BARBAROSSA, Emperor of Germany. See **FREDERICK I.**

BARBAROSSA, ARUCH or HORUG, the son of a renegade of Lemnos, and a noted pirate of the early sixteenth century. Having by his success in piracy on the coast of Barbary made himself master of twelve galleys stoutly manned with Turks, he rendered himself so formidable that Selim Eutemi, ruler of the country about Algiers, called in his assistance against the Spaniards. Being admitted into Algiers with his men, he caused Selim to be strangled in a bath, and himself to be proclaimed king. He acted with the greatest tyranny, thus producing a revolt among the Arabs, who sought the aid of the king of Tunis. This confederacy was defeated, and Tunis itself taken, of which Barbarossa also declared himself the sovereign. He then marched to Tlemcen, the prince of which he also defeated, and was admitted into their capital by the people, who first beheaded their fugitive king. The next

heir of Tlemcen then applied for aid to Gomez, governor of Oran for Charles V., who marched with a powerful army towards Tlemcen. Barbarossa leaving the town, with his Turks, to meet this new enemy, the people shut the gates; on which he endeavoured to flee, but, being overtaken, fought like a lion in the tolls, and was cut to pieces, with all his followers, in the forty-fourth year of his age, A.D. 1518.

BARBAROSSA, **HAYRADIN** or **KHAYR EDDIN**, younger brother of the preceding. He was left by Aruch to secure Algiers, when he marched against Tunis, and on his death was proclaimed king in his place. Finding his authority insecure, he made application to the Ottoman sultan Soliman, offering to recognize his superiority, and become tributary, provided a force was sent to him sufficient to maintain him in his usurpation. Soliman agreed to his proposals, and, ordering him a reinforcement of janizaries, invested him with the dignity of viceroy or pasha over the Kingdom of Algiers. Thus reinforced, Hayradin built a wall for the improvement of the harbour, strengthened it with fortifications, and may be deemed the founder of that mischievous seat of piracy as it existed till the year 1830. Such was his reputation for naval and military talents, that Soliman II. made him his capitan pasha. In this capacity he signalized himself by a long course of exploits against the Venetians and Genoese; and in 1543, when Francis I. made a league with Soliman, Barbarossa left Constantinople, and with a powerful fleet, having the French ambassador on board, took Reggio, and ravaged the coast of Italy. In conjunction with the French he also besieged and took Nice; and refitting during the winter at Toulon, again ravaged the coast and islands of Italy in the ensuing spring, and returned with many prisoners and much spoil to Constantinople. From this time he seems to have declined active service, and to have given himself up to a voluptuous life among his female captives, until the age of eighty, when he died, and his successor Hassan became possessed of his authority and riches. With the ferocity of a Turk and a corsair, he possessed some generous sentiments, and obtained a character for honour and fidelity in his engagements.

BARBARY, the most northerly general division of North Africa; bounded n. by the Mediterranean, e. by Egypt, s. by the desert of Sahara, and w. by the Atlantic; length from e. to w. about 2800 miles, breadth from n. to s. varying from about 140 to 550 miles; superficial extent estimated at about 741,650 square miles; pop. about 10,000,000. It comprises the Empire of Morocco and Fez on the w., the French colony of Algeria and protectorate of Tunis in the centre, and the province of Tripoli, including Barca and Fezzan, on the e. Its different parts were known to the ancients under the names of Mauritania, Numidia, and Africa Proper. The climate of the northern portion of Barbary, lying between the Atlas Mountains and the Mediterranean, is more like that of Southern Europe than that of Africa; the soil, watered by numerous small rivers, is much more fruitful. Barley, wheat, maize, millet, and rice are generally cultivated. Fruit-trees, such as the vine, fig-tree, the pomegranate and orange trees, abound. The cypress, the cedar, the almond-tree, the fragrant cistus, and the splendid caesop, grow everywhere. The sugar-cane flourishes excellently. The lotus and palm-tree are of great advantage to the inhabitants. The animals comprise the camel, horse, buffalo, sheep; wild boars, apes, jackals, hyenas, lions, and panthers are to be found in the interior. Birds are numerous, and there is abundance of river and sea fish and turtles. The population belongs to various races: the Berbers, the original inhabitants, from whom the

country takes its name; the Arabs, who conquered an extensive portion of it during the times of the caliphs, and who are now divided into two branches; the Bedouins or pastoral tribe; and the Moors, who inhabit the towns; Jews, found in Morocco and Algiers; Turks; and the French colonists of Algiers, &c. This extensive and beautiful country was distinguished for industry and prosperity under the Carthaginians, Romans, and Arabians. Its intercourse with the coasts of Europe was far more easy and quick than that of those coasts with their own capital cities, and the transport of goods was less expensive from Marseilles and Genoa to Tunis and Algiers than to Paris, or even to Milan or Turin. Barbary was, next to Egypt, the richest of the Roman provinces, and one of the granaries of the mistress of the world. The little Arabian courts of Tetuan, Fez, Tlemcen, Garbo, and Constantine encouraged the arts and agriculture. Naples, Messina, Pisa, Genoa, and Florence enriched themselves by their intercourse with the country; and Venetian ships visited all the cities of the coast. Three centuries ago an end was put to all this prosperity: the land became the abode of crime and misery, the prey of piratical adventurers from all parts of the world (see **BARBAROSSA**), who were detested by the natives, and for long the most dangerous enemies to European maritime commerce. Since France has taken possession of Algeria piracy has been driven from its stronghold, and the Barbary corsairs have long ceased to be a terror to commerce. See **ALGERIA**, **BARCA**, **FEZ**, **FEZZAN**, **MAROCOO**, **TRIPOLI**, and **TUNIS**.

BARBARY APE (*magot*), a small species of ape of the genus *Macacus*, interesting as being the only animal of the monkey kind found in Europe. The magot is found on European soil in one spot only—the rock of Gibraltar, where the individuals are few in number; whence it has been concluded by M. de Blainville that they have sprung from domesticated apes escaped from confinement in the houses of Gibraltar. The Barbary magot is a small tailless monkey, completely covered with greenish-brown hair. In its wild state it is lively and intelligent, but becomes sullen and intractable in captivity. It feeds on fruits, roots, &c., and often plunders the gardens. See plate at article **APR**.

BARBASTRO, a city, Spain, Arragon, in the province, and 28 miles s.e. of Huesca, in a mountain district, occupying a declivity, at the top of which stand the principal buildings and older parts of the town; and at its base runs the river Nero, crossed by two bridges of stone and one of wood. The city has straight, well-made, and paved streets, several squares, a cathedral, parish church, college, Latin and three other schools, townhouse, session-house, ecclesiastical court-house, extensive hospital, two prisons, several convents with churches attached, two palaces, a theatre, and bull-ring. In the vicinity are fine gardens and promenades, adorned with luxuriant trees and elegant fountains. It also possesses philosophical, agricultural, commercial, and other literary and beneficent associations. The manufactures of Barbastro have greatly declined, consisting only of hats, hardware, cutlery, shoes, and ropes; and a little trade is carried on in cattle, horses, and mules. Pop. (1897), 7194.

BARBAULD, **ANNA LETITIA**, daughter of the Rev. John Aikin, was born at Kibworth, in Leicestershire, June 20, 1743. She received from her father a classical education, and early showed a disposition for poetry. Her earliest production was a small volume of miscellaneous poems, printed in 1772, which in the year following was succeeded by a collection of pieces in prose, published in conjunction with her brother, Dr. John Aikin, of Stoke-Newington. In 1774 she accepted the hand of the Rev.

Rochemont Barbauld. Her Early Lessons and Hymns for Children, and various essays and poems, have secured for her a permanent reputation. In 1786 she accompanied her husband on a tour to the Continent. In 1812 appeared the last of her separate publications, entitled Eighteen Hundred and Eleven, a poem of considerable merit; previous to which she had amused herself by selecting and editing a collection of English novels, with critical and biographical notices. A similar selection followed from the best British essayists of the reign of Anne, and another from Richardson's manuscript correspondence, with a memoir and critical essay on his life and writings. Mrs. Barbauld died at Stoke-Newington, March 9, 1825, in her 82d year, leaving behind her many unpublished manuscripts both in prose and verse.

BARBEL (*Barbus*), or **BEARDED FISH**, a genus of fresh-water abdominal malacoptygious (having fins with soft rays) fishes, of the family Cyprinidae or carps, distinguished by the shortness of the dorsal and anal fins, a strong spine replacing the second or third ray of the dorsal, and four fleshy filaments growing from the lips, two at the nose, and one at each corner of the mouth, and forming the kind of beard to which the genus owes its name. Of the several species, generally named after the country or river where they are found, the European one, common in most of the rivers of its temperate climates, and hence called *B. vulgaris*, is most deserving of notice. Its average length is from 12 to 18 inches, but individuals have been taken measuring 3 feet, and weighing from 15 to 18 lbs. In its form and habits it strongly resembles the pike. Its body is elongated and rounded, olive-coloured above and bluish on the sides, and covered with small scales. The fins are reddish, and the caudal, which is forked, has a tinge of black. The head is smooth and oblong, and the upper jaw is much longer than the lower. Its dorsal spine, which is strong and serrated, often inflicts severe wounds on the fishermen, and damages their nets. It lives on small fishes, and also on aquatic plants, worms, and insects, which it obtains by boring with its snout into the banks of the stream and turning up the loose soil. It is also said that the barbel, by setting small animals adrift in boring the soil, attracts the fishes on which it preys. It is very common in the Thames, where it gives good sport to the angler; but its flesh is very coarse and unpalatable, and at the time of spawning the roe is dangerous to eat. Another species, common in the Nile, is described at length by Bruce, who says that it sometimes weighs upwards of 70 lbs., and has a flesh which is fine, delicate, and well-flavoured. When caught, the fisherman, instead of killing it, puts an iron through its jaw, and fastens it by a short cord to the bank of the river, where it remains alive till required for actual use. Bruce saw ten or twelve thus fastened, and bought two, on which his whole boat's crew were amply dined.

BARBERINI, a celebrated Florentine family, which, since the elevation of one of its members, the Cardinal Maffeo Barberini, to the pontificate under the name of Urban VIII. (pope from 1623 to 1644), has occupied a distinguished place among the nobility of Rome. Few of the popes have carried nepotism so far as Urban VIII., who, during his reign of twenty-one years, seemed intent only on one object, the aggrandizement of his three nephews. Two of them were appointed cardinals, and the third became Prince of Palestrina.

BARBERRIES. Barberries are a beautiful red and oblong-shaped fruit, produced in small bunches by a shrub (*Berberis vulgaris*) with somewhat oval, serrated, and pointed leaves; thorns, three together, upon the branches, and hanging clusters of yellow

Sowers. So great is the acidity of this beautiful fruit, that even birds refuse to eat it. In this respect it nearly approaches the tamarind. When boiled with sugar, it makes an agreeable preserve, rob, or jelly, according to the different modes of preparing it. Barberries are also used as a dry sweetmeat, and in sugar-plums or comfits; are pickled with vinegar, and are used for the garnishing of dishes. They are well calculated to allay heat and thirst in persons afflicted with fevers. The bark of the barberry shrub is said to have been administered with effect in cases of jaundice, and in some other complaints; and the inner bark, with the assistance of alum, dyes linen a fine yellow colour. The roots, particularly their bark, are employed in Poland in the dyeing of leather. The barberry was originally a native of eastern countries, but is now generally diffused in Europe. It thrives best in light and chalky soils. It was formerly abundant in England, growing wild in the hedgerows, but has been almost universally banished from the prevalent belief that it has an injurious influence on the growth of corn. This popular impression seems to take various forms, which may either be taken to indicate that it has no very solid foundation, or that the real cause, if any, is less widely known than the result. Its presence has been supposed to render corn abortive, and it has also been said to influence the production of mildew. Scientific naturalists generally in England and France do not favour either supposition; but as the Royal Agricultural Society of Lille, a well-informed body, came, after examination, to the opinion that the latter opinion was not without foundation, the question may be considered as yet unsettled. An interesting circumstance in regard to the barberry is that the completion of its fructification depends upon the irritation of its stamens by insects, by which the filaments are made to contract towards the pistil. It has been supposed the barberry may become injurious to other plants by the attractions which it consequently affords to insects. The barberry is a highly ornamental shrub.

BARBETS (*Bucconidae*), a family of birds belonging to the Scansores or climbers, in which the outer toe is directed backward like a thumb, enabling them to grasp the trunks or branches of trees. The barbets have a thick conical beak, bulged on both sides at the base, with five tufts of bristles directed forwards. Their wings are short and their flight somewhat heavy. They subsist on insects or fruits, and sometimes attack smaller birds. They have been divided into three sub-genera:—The *barbicans* (*Pogonias*) inhabit India and Africa, and feed chiefly on fruit. Their bristles are very stout. The upper mandible is obtuse and much curved, with one or two deep notches on each side.—The *barbets* proper (*Burco*) have the beak conical, slightly compressed, with a blunt ridge. They are nearly related to the woodpeckers.—The *puff-birds* (*Tamias*) inhabit America, and feed on insects. Their beak is more elongated and compressed, the head large, and the tail short. The feet of the barbets are adapted both for ascending and descending the trunks of trees; they wait for their prey usually in a sitting attitude, and seize it in darting. They are slightly gregarious, associating in pairs at the breeding season, and at other times in small groups.

BARBETTE, an elevation of earth behind the breastwork of a fortification or an intrenchment, from which the artillery may be fired over the parapet. The height of the breasting (the part of the parapet which covers the cannon) is generally $8\frac{1}{2}$ feet; the length of the barbette, 14–16 feet; the breadth for every cannon, 16–18 feet. An ascent leads from the interior of the intrenchment to the

barbette. When the garrison has much heavy ordnance, or the enemy has opened his trenches, or when it is determined to cannonade the intrenchments of a given point, as, for example, a bridge or pass, and the direction of the cannon is not to be materially changed, it is usual, instead of making a barbette, to cut embrasures in the parapet: on the contrary, firing from the barbette is expedient when one expects to be attacked only by infantry, or wishes to cannonade the whole surrounding country.

BARBICAN, or **BARBACANE** (Italian, *barbacane*), an outer work of an ancient fortification, usually a tower to defend the drawbridge of a town or castle; also a watch-tower for decrying the enemy. An opening in the wall of a fortress, through which guns are levelled, is likewise called a barbican.

BARBIÉ DU BOCAGE, **JEAN DENIS**, a distinguished geographer, born in Paris in 1760; died in 1825. Geographer to the ministry of foreign affairs in 1780, and assistant in the cabinet of medals in 1785, he laid the foundation of his fame in 1788 by the publication of his beautiful *Atlas to the Voyage du Jeune Anacharsis*, and was appointed in 1792 keeper of the maps of the Royal Library, and in 1809 professor at the Sorbonne. In 1821 he founded the Geographical Society, of which he became president. He was also a member of the Institute. The science of ancient geography was indebted to his studies for considerable progress. His maps and plans to the *Voyage Pittoresque en Grèce*, de Choiseul Gouffier, and to the works of Thucydides, Xenophon, &c., exhibit much erudition. He also prepared many modern maps, and published excellent dissertations in various scientific collections. Although the progress of time has necessarily deprived much of his work of its original value, his labours have not the less given a decided stimulus to the progress of science.

BARBIER, **ANTOINE ALEXANDRE**, bibliographer, was born at Coulommiers in 1765, and at the beginning of the revolution was a vicar. In the year 1794 he went to Paris, where he was chosen a member of the committee appointed to collect works of literature and art existing in the monasteries, which were then suppressed. This was the cause of his being appointed in 1798 keeper of the library of the *Conseil d'Etat*, collected by himself, and when it was transported to Fontainebleau in 1807, Napoleon appointed him his librarian. At the return of the king he had the care of his private library. He died in 1825. His excellent *Catalogue de la Bibliothèque du Conseil d'Etat* (Paris, 1801-3, two vols. folio) is now very rare. His *Dictionnaire des Ouvrages anonymes et pseudonymes* (Paris, 1806-9, four vols., 3d edit. 1824), is, on account of its plan, its accuracy, and its fulness (at least in respect to French literature), one of the best works which we have at present in this branch of bibliography.

BARBIERI, **GIAMFRANCESCO BARBIERI DA CENTO**. See **GUERCINO**.

BARBOUR, **JOHN**, an ancient Scottish poet, of whose personal history but few particulars are recorded. He appears to have been born about 1816, and educated for the church. In the year 1856 he was promoted to the archdeaconry of Aberdeen. In the following year he was appointed by the bishop of his diocese a commissioner to treat for the ransom of the captive King David II. About 1875 he was engaged in composing his celebrated poem of *The Bruce*, or the History of Robert I., King of Scotland. While engaged writing it he received a safe conduct from Edward III. to travel into Wales with six mounted attendants. The poem was first published in 1616, and a valuable edition of it appeared in 1790, three vols. 12mo, edited by Pinkerton, from a

MS. in the Advocates' Library, dated 1489. Another edited by Jamieson was published at Edinburgh, 1820 (two vols. 4to); but the best edition is that issued by the Early English Text Society. It is a work of great merit; and it is remarkable that Barbour, who was contemporary with Gower and Chaucer, is more intelligible to modern readers than either of them. Another poem, tracing the chronology of the Scottish monarchs from a Trojan chief, which he appears to have been engaged on, has been entirely lost. He is also the author of a work containing the lives of a number of saints in verse, which has been published in Germany. He died at an advanced age in 1396.

BARBUDA, one of the Caribbee Islands, in the West Indies, belonging to Great Britain, about 15 miles long and 8 wide; 25 miles due north of Antigua; pop. 580. The island is low, well covered with wood, and still affords shelter to some wild deer. Its chief products are salt and phosphate of lime; and it also exports cattle to Antigua. The island has no harbour, but a well-sheltered roadstead on the w. side. The climate is healthy, and invalids resort hither from the other islands. This island is a dependency of Antigua.

BARBY, a Prussian town on the left bank of the Elbe, in the government of, and 14 miles s.e. of Magdeburg. It is well built and has an old castle. Manufactures of linen and cotton, soap-works, breweries, and distilleries. Pop. (1900), 6137.

BARCA, a country of Northern Africa, lying east of Tripoli, and belonging to Turkey, about 500 miles long by 400 miles wide. Barca forms a portion of the ancient Cyrenaica, in its widest sense, where the Greeks had two flourishing colonies; Barca, from which the country takes its modern name, and Cyrené, from which it had its ancient designation. From the time of the Ptolemies the region was called Pentapolis, from the five Greek cities, Cyrene, Barca, Teuchadra, afterwards Arinoté, Hesperides, afterwards Berenice, and Apollonia. Berenice alone, now called Bengaz, is of any importance as a modern town. The Greeks were followed in possession of the country by the Romans, and the monuments of both peoples remain in the ruins of their cities. It was long thought, from ancient representations, that the country was completely barren; but this description is now understood to apply only to the southern portion of it, bordering on the Libyan Desert. The sides and summits of the hills in the s. and n. are fertile, and yield abundant crops and excellent pasture. Cyrené was formerly regarded as one of the chief granaries of the African coast. The other chief productions are the date palm, fig, and olive. The loftiest heights do not exceed 1800 feet. Many of them are wooded, but the want of water keeps vegetation within narrow limits. Flowering shrubs, however, occur in great variety, including among others, roses, laurestinæ, honeysuckles, &c. The Bedouin inhabitants have numerous camels and other cattle, constituting their principal wealth. Among beasts of prey the most common are hyenas and jackals; noxious insects also abound. There are hardly any permanent streams, most of the water-courses being of the nature of mountain torrents, which lose themselves in the sands of the Libyan Desert. The eastern portion, however, is tolerably well supplied with water by rains and springs. The chief exports of the country consist of grain and cattle, along with ostrich feathers and ivory, brought by caravans from the interior. Next to Bengaz, the capital, the seaport of Derna is the chief town. Barca used to form a dependency of Tripoli, but since 1879 it has been an independent vilayet of the Turkish empire. The pop. is variously estimated, but probably does not much exceed 800,000.

BARCAROLLE (Fr. *barcarolle*, from *la barcarolo*, a boatman), a kind of song of the gondoliers at Venice, often composed by themselves, to some simple and pleasing melody, such as the stroke of the oar may keep time to. The name is also given to any melody written in a similar style. Such melodies are sometimes introduced into operas, and have been written for the piano.

BARCELONA, the second largest city of Spain, capital of the province of the same name and of the military department of Catalonia, is handsomely built, in the shape of a half-moon, on the coast of the Mediterranean, between the mouths of the Llobregat and the Besos. It was, even in the middle ages, one of the principal commercial places on this sea; is fortified, and has on the E. side a strong citadel, built in 1715. On the W. side lies the hill of Montjuich, with a fort which protects the harbour. Barcelona is divided into the upper and lower town, and contained, including the adjoining Barcelonetta, in 1895, 325,244, or, with other suburbs, 523,943 inhabitants. Its manufactures are the most important in Spain. The principal are cottons, silks, woollens, machinery, iron-castings, paper, glass, mathematical instruments, chemicals, stoneware, soap. There are also dye-works, tanneries, &c. The harbour is spacious, and has an entrance 300 yards wide between two long piers. The entrance is protected by a large mole, which has been recently extended, and there is a large dry dock. The exports largely consist of manufactured goods, wine and brandy, fruit, oil, &c. The so-called Barcelona (hazel) nuts are not exported from Barcelona, but from Tarragona. The imports are varied, and comprise machinery, textile fabrics, and coals, from Britain; silks, chemicals, liqueurs, and other articles from France; salt-fish from the North Sea ports; hides from the river Plate; timber from the Baltic; and especially raw cotton from America; coffee, tobacco, and sugar. The value of the imports from Britain has recently varied from over £1,000,000 to nearly £2,000,000 per annum, the value of the exports being about a tenth of this. The city contains a university (in a noble pile of buildings commenced in 1872), several public libraries, a museum, a school for engineers and artillery, an academy of belles-lettres, a founding hospital, a general hospital, large enough to contain 3000 sick persons, a deaf-and-dumb institution, a large arsenal, a cannon foundry, several large theatres, a cathedral dating from the thirteenth century, &c. It is altogether a beautiful and agreeable town, with various interesting features and highly picturesque surroundings. Electric lighting and electric tramways have been introduced. Barcelona was an important city from a very early date, and was from the ninth until the twelfth century governed by its own counts; but afterwards, by the marriage of Raymond IV. with the daughter of Ramiro II., king of Arragon, it was united with that kingdom. In 1640 it withdrew, with all Catalonia, from the Spanish government, and submitted to the French crown; in 1652 it submitted again to the Spanish government; in 1697 it was taken by the French, but restored to Spain at the Peace of Ryswick. In the war of the Spanish Succession Barcelona took the part of the Archduke Charles; but in 1714 it was besieged by the troops of Philip V., under the command of the Duke of Berwick, and taken after an obstinate resistance. The strong citadel on the E. side of the city was then erected to overawe the inhabitants. On February 16, 1809, Barcelona was taken by surprise by the French troops under General Duhesme, and remained in the power of the French until, in 1814, all their troops were recalled from Catalonia to defend their own country. In 1821 the yellow fever

carried off 40,000 of the inhabitants. The city has been the scene of many serious and sanguinary revolts, particularly in 1832, 1836, 1840, and 1841. Latterly industry and commerce have rapidly increased, the construction of railways contributing to this result. It is regarded as the centre of the Anarchist movement in Spain.

BARCLAY, ALEXANDER, an English, or more probably Scottish, poet of the sixteenth century. Very little is known concerning him except what we learn from his writings, which inform us that he was a priest and chaplain at St. Mary Ottery, in Devonshire, and afterwards a Benedictine monk of Ely. He was born about 1475, and studied at Oriel College, Oxford, about 1495, and obtained preferment after the Reformation, being vicar of Much Badew, in Essex, and of St. Mathew at Wokey, Somerset. His death took place in 1552, a short time after he had been presented to the living of All-Hallows, in London. The principal work of this poet is a satire, entitled *The Ship of Fools of the Worlde*, 1509, a free translation of a German composition. (See BRANDT, SEBASTIAN.) Barclay also wrote Eclogues, which are curious and interesting for the descriptions they afford of the characters and manners of the age. An edition of the *Ship of Fools*, by T. H. Jamieson, was published at Edinburgh in 1874.

BARCLAY, JOHN, was born at Pont-à-Mousson, in France, in 1582, and educated in the Jesuits' College there. He accompanied his father to England, where he was much noticed by James I., to whom he dedicated a politico-satirical romance, entitled *Satyrikon*, in Latin, chiefly intended to expose the Jesuits, against whom the author adduces some very serious accusations. He wrote also several other works, among which is a singular romance, in elegant Latin, entitled *Argenia*, which first appeared at Paris in 1621, the year of his death. It is an allegory, of a character similar to that of *Satyrikon*, and alludes to the political state of Europe, and especially France, during the league. Like the earlier work, it has been several times reprinted, and has also been translated into several of the modern languages, including English.

BARCLAY, ROBERT, the celebrated apologist of the Quakers, was born on Dec. 23rd, 1648, at Gordons-town, in the county of Moray, of an ancient and honourable family. The troubles of the country induced his father, Colonel Barclay, to send him to Paris, to be educated under the care of his uncle, who was principal of the Scots College in that capital. Under his influence he was easily induced to become a convert to the Roman Catholic religion, upon which his father sent for him to return home; and Colonel Barclay soon after becoming a Quaker, his son followed his example. Uniting all the advantages of a learned education to great natural abilities, he soon distinguished himself by his talents and zeal in the support of his new opinions. His first treatise in support of his adopted principles was published at Aberdeen in the year 1670, under the title of *Truth cleared of Calumnies*, &c. It is written with great vigour, and, with his subsequent writings, tended materially to rectify public sentiment in regard to the Quakers, as also to procure them greater indulgence from government. To propagate the doctrines, as well as to maintain the credit he had gained for his sect, he published in 1675 a regular treatise, in order to explain and defend the system of the Quakers, which production was also very favourably received. These and similar labours involved him in controversies with the leading members of the University of Aberdeen, and others; but, notwithstanding so much engrossment, his mind was at the same time busy with his great work in Latin, *An Apology for the True Christian Divinity*, as the same is preached and held

forth by the People in scorn called Quakers. It was published at Amsterdam in 1676, and an English translation appeared later in the same year. It was subsequently translated into German, Dutch, French, Spanish, and Danish, and part of it has appeared in Arabic. His fame was now widely diffused; and he travelled with the famous William Penn and George Foxe through the greater part of England, Holland, and Germany, to spread the opinions of the Quakers. The last of his productions, in defence of the theory of the Quakers, was a long Latin letter addressed, in 1676, to Adrian de Paets, On the Possibility and Necessity of an Inward and Immediate Revelation. It was not published in England until 1686; from which time Barclay, who had endured his share of persecution, and been more than once imprisoned, spent the remaining part of his life in the bosom of a large family, in quiet and peace. He died, after a short illness, at his own house of Ury, near Stonehaven, in Kincardineshire, on Oct. 3rd, 1690. With few exceptions, both partisans and opponents unite in the profession of great respect for the character and talents of Barclay. Besides the works already mentioned or alluded to, he wrote Catechism and Confession of Faith (1678); These Theologies (1676), of which the Apology was a defence; The Anarchy of Ranters (1676); Universal Love Considered and Established upon its Right Foundation (1677); and various replies to the most able opponents of his Apology. In 1692 a collected edition of his works appeared under the title Truth Triumphant. It was republished in 1717-18. Captain Barclay of Ury, the famous pedestrian, was a descendant.

BARCLAY DE TOLLY, MICHAEL, PRINCE, a distinguished general and field-marshal of Russia, was born in Livonia in 1761, died at Interburg on May 14th, 1818. His family, which was of Scottish origin, had been established in Livonia since 1689. He entered the army at an early age, but only received the rank of lieutenant in 1786, and attained that of lieutenant-colonel in 1794. His long service as a subordinate in various campaigns against the Turks, Swedes, and Poles, laid the basis of a valuable experience, and served to develop his great natural capacity for command. At Eylau he was wounded in the arm, and after the battle he received the rank of lieutenant-general. He was next employed against the Swedes, gaining great distinction, and was named governor-general of Finland. In 1810 he was named minister of war. He occupied this position in 1812, when Napoleon invaded Russia, but was soon appointed to the chief command of the army, and succeeded in the ministry of war by Prince Gortchakoff. He adopted a plan of retreat, which was soon seen to be a strict necessity, as the Russian army, officially estimated at more than 500,000, did not greatly exceed 100,000 men. In this difficult campaign Barclay proved no unworthy opponent of Napoleon himself. Notwithstanding, the Russians became impatient of a policy which seemed to show no active results, while jealousy of the foreign extraction of Barclay and other causes completed his overthrow, and after the capture of Smolensk by the French he was superseded by Kutusoff. Serving under his successor, he commanded the right wing of the Russian army at the battle of the Moskwa, maintained his position, and covered the retreat of the rest of the army. After the battle of Bautzen, in 1813, at which he again distinguished himself, he was reappointed to the chief command, which he had soon after to resign to Prince Schwarzenberg. He forced the surrender of General Vandamme, who had been detached by Napoleon for some special operations, after the battle of Dresden, and took part in the decisive battle of Leipzig. On crossing the Rhine at the head of the Prussian troops he issued a strict

proclamation, forbidding all licence on the part of his soldiers, and by the maintenance of an exact discipline he conciliated the French as much as possible to the invaders. He was made a field-marshal in Paris. In 1815 he commanded a mixed corps of continental troops. In this year he received from the emperor the title of prince, and from Louis XVIII. the badge of the order of Military Merit. On his return to Russia his health began to decline, and he died in Prussia on his way to the Bohemian baths. The Emperor Alexander caused a statue to be erected to him in one of the principal places of St. Petersburg.

BAR-COCHBA, a celebrated Jewish impostor of the second century A.D., who pretended to be the Messiah. He called himself, or was called by his followers, Bar-cochba, meaning Son of the Star, and applied to himself Balaam's prophecy, 'There shall come a star out of Jacob', &c. He obtained the support of the celebrated Rabbi Akiba, and availing himself of the general dissatisfaction produced among the Jews by Hadrian's attempt to erect a temple to Jupiter on the site of the temple of Jerusalem, raised the standard of revolt, and soon mustered numerous followers. After carrying on a kind of guerrilla warfare, he made himself master of Jerusalem about 132, and gained possession of about fifty fortified places. Hadrian, who had at first despised the insurrection, now saw the necessity of acting more vigorously, and sent to Britain for Julius Severus, one of his ablest generals, who, avoiding a general engagement, gradually made himself master of the different forts which the rebels possessed, and then, though not without great loss, took and destroyed Jerusalem. Bar-cochba retired to a mountain fortress, and perished in the assault of it by the Romans three years after, about 135.

BARD, a designation of uncertain etymology, often applied to the ancient poets of the Celtic tribes, who, in battle, raised the war-cry, and in peace sang the exploits of their heroes, celebrated the attributes of their gods, and chronicled the history of their nation. At one time spread over a great part of western Europe, they seem to have been the heralds, the priests, and the lawgivers of the Celtic tribes who occupied its ancient forests, until, by the gradual progress of southern civilization and conquest, they were driven back into the fastnesses of Wales, Ireland, and Scotland, where the last echoes of their harps have long since died away. Their early history is uncertain. Diodorus tells us that the Celts had bards, who sang to musical instruments; and Strabo testifies that they were treated with respect approaching to veneration. There is a passage in the Germania of Tacitus in which a word occurs that some have read as *barditus*, and translated *bard's song*; but *bardus* appears to be the true reading, and the true signification merely war-cry. The first Welsh bards of whom anything is extant are Taliesin, Aneurin, and Llywarch Hen, of the sixth century; but their language is imperfectly understood. From the days of these early representatives of the bards we have nothing further till the middle of the tenth century, when the reputation of the order was increased under the auspices of Howel Dha. A code of laws was framed by that prince, to regulate their duties and fix their privileges. They were distributed into three classes, with a fixed allowance; degrees of rank were established, and regular prize contests, known as *cisteddys*, were instituted. Their order was frequently honoured by the admission of princes, among whom was Llewellyn, last king of Wales. The Britons, kept in awe as they were by the Romans, subsequently harassed by the English, and eternally jealous of the attacks, the encroachment, and the neighbourhood of aliens, were, on this account, attached to their Celtic manners. This situation and

these circumstances inspired them with a proud and obstinate determination to maintain a national distinction, and preserve their ancient usages, among which the bardic profession is so eminent. Sensible of the influence of their traditional poetry in keeping alive the ideas of military valour and of ancient glory among the people, Edward I. is said to have collected all the Welsh bards, and caused them to be hanged by martial law as stirrers up of sedition. On this incident is founded Gray's well-known ode—'The Bard.' We, however, find them existing at a much later period, but confining themselves to the humble task of compiling private genealogies. But little is known of the music and measures of the bards: their prosody depended much on alliteration: their instruments were the harp, the pipe, and the crwth. Some attempts have lately been made in Wales for the revival of bardism, and the Cambrian Society was formed in 1818, for the preservation of the remains of this ancient literature, and for the encouragement of the national muse. The bardic institution of the Irish bears a strong affinity to that of the Welsh. The genealogical sonnets of the Irish bards are still the chief foundations of the ancient history of Ireland. Their songs are strongly marked with the traces of Skaldic imagination, which still appears among the 'tale-tellers,' a sort of poetical historians, supposed to be the descendants of the bards. There was, also, evidently a connection of the Welsh with Armorica. Hence, in the early French romances, we often find the scene laid in Wales; and, on the other hand, many fictions have passed from the Troubadours into the tales of the Welsh.—In the Highlands of Scotland there are considerable remains of compositions supposed to be those of their old bards still preserved. Of these, the poems of Ossian, said to be collected and translated by MacPherson, were the most celebrated, but the best authorities have decided that they are spurious.

BARDESANES THE GNOTIC, a Syrian who lived, in the latter half of the second century, in Edessa, and was a favourite of the King Abgar Bar Maanu, is memorable for the peculiarity of his doctrines. He considered the evil in the world only as an accidental reaction of matter, and all life as the offspring of male and female *Æons*. From God, the inscrutable Principle of all substances, and from the consort of this first Principle, proceeded Christ, the Son of the Living, and a female Holy Ghost; from these, the spirits or created powers of the four elements; thus forming the holy eight, or the godlike fulness, whose visible copies he found in the sun, the moon, and the stars, and therefore attributed to these all the changes of nature and of human destiny. The female Holy Ghost, impregnated by the Son of the Living, was, according to him, the Creator of the world. The human soul, originally of the nature of the *Æons*, was confined in the material body only as a punishment to its fall, but not subjected to the dominion of the stars. He considered Jesus, the *Æon* destined for the salvation of souls, only a feigned man, and his death only a feigned death, but his doctrine the sure means to fill the souls of men with ardent desires for their celestial home, and to lead them back to God, to whom they go immediately after death, and without a resurrection of the earthly body. Bardesanes propagated this doctrine in Syrian hymns, and is the first writer of hymns in this language. His son, Harmonius, studied in Athens, and strove, also by means of hymns, to procure the reception of his doctrine. Yet the Bardesanists did not formally separate themselves from the orthodox Christian church. They maintained themselves until the fifth century. A fragment of the work of Bardesanes upon destiny is pre-

served in the Greek language, by Eusebius (Pwpar. Evangel. lib. vi. cap. 10). He led an irreproachable life. Fragments of his Syrian hymns, which display a rich and ardent fancy, are to be found in those hymns which the Syrian patriarch Ephraim composed against his doctrine.

BAREBONE, or **BARBON**, PRAISE-GOD, a name familiar to readers of English history from its bearer's connection with the brief parliament of 1653, which Cromwell substituted for the Long Parliament. Barebone himself was a leather seller in Fleet Street in London, and was well known in his day as a prominent preacher among the Baptists. He made himself notorious as an enemy of the monarchy, and in 1660, on Monk's arrival in London, Barebone, at the head of a numerous mob, presented a petition to Parliament against the restoration of the Stuarts. In 1661 he was committed to the Tower, and remained for some time in confinement. He died in 1679, aged over eighty.

BAREFOOTED FRIARS, monks who use sandals, or go barefoot. In several orders of mendicant friars—for example, among the Carmelites, Franciscans, Augustines, there are congregations of barefooted monks and nuns, but nowhere a separate order of this kind.

BAREGES (ancient *Vallatria*), a watering-place in the s. of France, department of the Hautes-Pyrénées, 22 miles s. from Tarbes, celebrated for its thermal springs. It is situated in a valley between two perpendicular chains of mountains, along with numerous other villages, containing together about 60,000 inhabitants. From June to September it is crowded with patients, but is a very dull-looking place, though some of the wildest scenery of the Pyrenees is to be seen at no great distance from it.

BAREILLY, a town of Hindustan in the N.W. Provinces, capital of a district of same name, 181 miles s.e. from Delhi. It has a pleasant and elevated site, and contains one well-built street, but the greater part of the town consists of a mere assembly of wretched hovels. There are here an old and a new fort, and cantonments in the environs. The principal manufactures are sword-outlery, gold and silver lace, and perfumery. On the outbreak of the Indian mutiny the native garrison mutined and took possession of the place. It was retaken by Lord Clyde in May, 1858. The population in 1881 was 101,688; in 1891, 121,680; in 1901, 117,438.

BARETTI, **JOSEPH**, an Italian writer, was the son of an architect of Turin, where he was born in the year 1716. He received a good education and some paternal property, which, according to his own confession, he soon gambled away. In 1748 he repaired to England. In 1753 he published in English a Defence of the Poetry of Italy against the Censures of M. Voltaire. About this time he was introduced to Johnson, then engaged in the compilation of his Dictionary, of which Baretti availed himself to compile an Italian and English dictionary in 1760, much more complete than any which had hitherto appeared. In this year he revisited his native country, and published at Venice a journal under the title of *Frustra Literaria*, which met with great success, but, owing to the severity of its criticisms, subjected the author to unpleasant if not dangerous consequences. After an absence of six years he therefore returned, through Spain and Portugal, to England, and in 1768 published an Account of the Manners and Customs of Italy. Not long after his return from Italy an incident occurred to him of the most distressing nature. Accosted in the Haymarket by a woman of the town, he repulsed her with a degree of roughness which produced an attack from some of her male confederates, and in the scuffle he

struck one of the assailants with a French pocket desert-knife. The man pursued and collared him, when Baretti, still more alarmed, stabbed him repeatedly, inflicting wounds of which he died next day. He was immediately taken into custody, and tried for murder at the Old Bailey, but acquitted. On this occasion Johnson, Burke, Goldsmith, Garrick, Reynolds, and Beaulieu gave testimony to his good character. In 1770 he published his *Journey from London to Genoa through England, Portugal, Spain, and France*—a work replete with information and entertainment. He also continued to publish introductory works for students in the Italian and other modern languages, and superintended an edition of Machiavelli's works. He died on May 6th, 1789. His *Opere Scritte in Lingua Italiana* appeared at Milan in 6 vols., in 1818-18. Baron Pietro Custodi published his *Scritti Scelti, Inediti, o Rari*, in 1822.

BARFLEUR, a seaport of France, in the department of La Manche, about 15 miles n. of Cherbourg. It was at one time the best port on the coast of Normandy; but in the year 1346 it was taken and pillaged by Edward III., king of England, and the harbour destroyed. William the Conqueror fitted out at Barfleur the expedition which effected the conquest of England. Pop. (1890), 1015.

BARGE, a term similar in origin to *bark* or *barque*, but differing from it in use. By a barge is generally understood a flat-bottomed boat of some kind, such as are used on rivers and canals, the name including various craft, many of them carrying sails and being rigged in several ways. Formerly the name was given to a boat of state or pleasure used chiefly for ornamental purposes, and to the boat of the commanding officer of a ship of war.

BARHAM, REV. RICHARD HARRIS, a celebrated humorous writer, was born on Dec. 6th, 1788, at Canterbury, where his family had resided for several generations. He was educated at St. Paul's School, London, on leaving which he entered himself at Brasenose College, Oxford, and afterwards studied for the church, though his original destination was the legal profession. Having been ordained a clergyman, he was appointed to the curacy of Ashford, and from thence to that of Westwell, both in Kent. In 1814 he married, and was shortly afterwards presented to the rectory of Snargate, in Romney Marsh, in the same county. About this time he met with a severe accident, occasioned by the overturning of a gig, and causing the fracture of one leg and the spraining of the other. The confinement thus necessitated led to the composing of a novel, which was published under the title of *Baldwin*, but met with no success. Shortly afterwards he was elected one of the minor canons of St. Paul's Cathedral, and having now a considerable amount of leisure time on his hands, employed it in writing for Gorton's *Biographical Dictionary* and *Blackwood's Magazine*, to the former of which he contributed nearly one-third of the articles, and to the latter, *My Cousin Nicholas*, a tale of college life, which obtained a large share of popularity. In 1824 he was appointed one of the priests in ordinary of the chapel-royal, and was shortly afterwards presented to the rectory of the united parishes of St. Mary Magdalene and St. Gregory-by-St. Paul, London. In 1837, on the starting of Bentley's *Miscellany*, under the editorship of Charles Dickens, Mr. Barham laid the main foundation of his literary fame by the publication in that periodical of the *Ingoldsby Legends*—a series of humorous tales in verse which achieved an immense success, having in a collective form, from 1840 onwards, been published over and over again in various editions, with many 'legends' added to the original number. He did not, however, live many years to enjoy his literary

reputation, having caught a severe cold at the opening of the new Royal Exchange, which carried him off on June 17th, 1844. He had previously held the living of St. Faith's for several years. Though a brilliant member of society, and ranking with the most distinguished wits of the day, including his intimate friends Sydney Smith and Theodore Hook, Mr. Barham never neglected his more serious duties as a clergyman. His life has been written by his son (3rd edn., 1880).

BARI (ancient *Barium*), a flourishing seaport of Southern Italy, in Apulia, capital of the province Terra di Bari, situated on a promontory of the Adriatic. It was a place of some importance under the Romans, passed from them to the Saracens, and was afterwards selected as the seat of government by the Normans who conquered Apulia. It has been thrice destroyed and rebuilt on the same site. The present town, surrounded by walls, and defended by a castle, consists of a poorly-built old town with a better part of more recent date. It is the see of an archbishop, and possesses a cathedral with a tower 280 feet high, dating from the early half of the eleventh century, but largely spoiled by recent alterations. The church of San Nicola dates from 1087; and there is also a royal lyceum with some sixteen professors. Bari manufactures cotton and linen goods, hats, soap, glass, and liqueurs, and has a trade in wine, grain, almonds, oil, &c. Pop. (1894), 77,800.

BARILLA, the term applied in commerce to a product obtained from the combustion of certain marine vegetables. This word is the Spanish name of a plant (*Salicola soda*), from the ashes of which is produced the above substance, one of the sources of the alkali soda. Barilla is also procured from the ashes of prickly saltwort, shrubby saltwort, and numerous plants of other tribes. The barilla derived from the *Meembryanthemum nodiflorum* of Spain and the *M. copticum* of Africa contains from 25 to 40 per cent of carbonate of soda; whereas that from the *Salicola* and the *Salicornia* of other districts affords about half this quantity; and the particular variety known under the name of *kelp*, procured by burning various sea-weeds, is a still coarser article, not yielding above 2 or 3 per cent of real soda. To obtain the carbonate of soda it is only requisite to lixiviate the barilla in boiling water and evaporate the solution. On the shores of the Mediterranean, where the preparation of soda is pursued to a considerable extent, the seeds of the plants from which it is obtained are regularly sown in places near the sea. When the plants are sufficiently mature they are pulled up by the roots, dried, and afterwards tied in bundles to be burned. This is done in ovens constructed for the purpose, or in trenches dug near the sea. The ashes, while hot, are continually stirred with long poles, and the saline matter they contain forms, when cold, a solid mass almost as hard as stone. This is afterwards broken into pieces of convenient size for exportation. Barilla is but little used now. See **KELP**.

BARTONE, or **BARTYON**, a male voice, the compass of which partakes of those of the common bass and the tenor, but does not extend so far downwards as the one nor to an equal height with the other. Its best notes are from the lower A of the bass clef to the lower E or F in the treble; yet we find Verdi and Meyerbeer exacting G and even A flat from it. This name is also given to the smaller brass saxhorn in B flat or C, used in reed and brass bands.

BARIUM. See **BARTITES**.

BARK, **PERUVIAN**, is obtained from several trees belonging to the genus *Cinchona*, which grow spontaneously in many parts of South America, but more particularly of Peru. The trees are said somewhat to resemble a cherry-tree in appearance, and have white or pink flowers.—This valuable medicine was

formerly called *Jessie's bark*, from its having been introduced into Europe by the members of that order who were settled in South America. They were instructed in the use of it by the natives of Peru, to whom it had been long known; and it continued for many years a source of profit to the order. Its botanical name was derived from that of the Countess del Chinchón, the lady of a Spanish viceroy, who had been cured by it. The tree from which it is obtained grows abundantly in the forests of Quito and Peru, and the bark is cut by the natives in the months of September, October, and November, during which alone the weather is free from rain. The bark is of three kinds—red, yellow, and pale, of which the yellow and pale barks are the stronger in their febrifuge properties. The *crown-bark*, as the highest-priced is termed, is of a pale yellowish-red. The pale is the original Peruvian Cinchona, and is produced by several varieties of the *Cinchona officinalis*. The red is obtained from the *C. succirubra*, which grows chiefly in the forests of Ecuador around Chimborazo. The yellow sort is produced by the *C. calisaya*, and grows in Bolivia and Peru. The quantity of bark imported into Great Britain from South America is now comparatively small.

The uses of the bark in medicine are too well known to need description; but the chemical discoveries in relation to it are deserving of more particular mention. Its medicinal properties were found to depend upon the presence of a substance called *quinine*. This exists, more or less, in all kinds of Peruvian bark, but in quantities very unequal in the various kinds. It was discovered by Messrs. Pelletier and Caventou, who also ascertained that the most useful and permanent form of the substance was that of a neutral salt, in which it was combined with sulphuric acid, constituting the celebrated sulphate of quinine. This extract is so powerful that one grain of it is a dose; and thus does this minute quantity of powder supply the place of the nauseous mouthfuls of bark which were absolutely eaten by the unfortunate beings who were afflicted with ague before this invaluable article was discovered.

To provide more easily a supply of bark for the British army in India, the British government were led to commence the cultivation of the Cinchona in the hill districts of India. Plants were transported from South America in 1861, and have given rise to a number of thriving plantations. The Cinchona has also been successfully introduced into Ceylon, Java, the West Indies, and elsewhere. The great bulk of the bark now imported into the United Kingdom comes from India and Ceylon.

BARKEE'S MILL. See HYDRAULICS.

BARKING, a town, England, in the county of Essex, on the left bank of the Roding, about 2 miles above its junction with the Thames, and 7 miles N.E. from London; consisting chiefly of one principal street; houses mostly of brick and generally well built. It has a parish church, a handsome structure, with a lofty tower, and some fine public buildings. There are several important industrial works, the largest being a gas work employing many hands. Pop. in 1891, 14,801; in 1901, 21,547.

BAR-LE-DUC, or **BAR-SUB-ORNE**, a town, France, capital of the department of Meuse, 125 miles E. by S. from Paris, consists of an upper and a lower town, the former of which commands a fine view, is well built, and has several elegant mansions. The lower town extends into the valley traversed by the Orain, which is here crossed by three stone bridges. It is a busy active place, with many shops, manufactories, warehouses, and places of business. The streets are wide and well laid out; in particular those of Rochelle and the Capuchins, which are lined with

a double row of lime-trees, but the public buildings are of an inferior description. The chief manufactures are cotton yarn, cotton and woollen stuffs, printed calicoes, and coloured handkerchiefs. The preserved fruits and confectionery, as well as the wines of Bar-le-duc, are in repute. Pop. (1896), 15,531.

BARLETTA, a sea-port town in Italy, in the Neapolitan province of Bari, capital of the district of same name, on the W. shore of the Adriatic, 33 miles N.W. of Bari. It is a fortified place of the fourth class, and is surrounded by a single wall. In the market-place is a colossal bronze statue, about 18 feet high, supposed to represent the Emperor Heraclius. The cathedral is a fine Gothic edifice, the nave of which is supported by antique granite columns. There are several other churches, convents for both sexes, an orphan institution, a college founded by Ferdinand IV., and a theatre. The harbour is formed by a mole running out from the shore. It admits of small vessels only, but good anchorage-ground is found in the roadstead. Barletta has a considerable trade in grain, wine, almonds, and the other productions of the country, which are exported to the different ports of the Adriatic. Pop. 31,994.

BARLEY (in Latin, *hordeum*), a grain which has been known, like most other kinds of grain, from time immemorial. It has a thick spike; the calyx, husk, awn, and flower are like those of wheat or rye, but the awns are rough; the seed is swelling in the middle, and for the most part ends in a sharp point, to which the husks are closely united. The species are—1, common long-eared barley; 2, winter or square barley, by some called *big*; 3, sprat barley, or battle-door barley. All these sorts of barley are sown in the spring of the year, in a dry time. The square barley, or big, is chiefly cultivated in the more ungenial parts of Scotland, and is harder than the other sorts. Barley is emollient, moistening, and productive of expectoration: this grain was chosen by Hippocrates as a proper food in inflammatory distempers. The principal use of barley in England and America is for making malt for brewing or distilling; in some parts of the European continent horses are fed with it, and in other parts poor people make bread of it. In Scotland barley is a common ingredient for broths. Pearl barley and French barley are barley freed from the husk by means of a mill; the distinction between the two being, that pearl barley is reduced to the size of small shot, all but the heart of the grain being ground away.

BARLOW, JOEL, an American poet and diplomatist, was born at Reading, Connecticut, about 1755. In 1774 he was placed at Dartmouth College, New Hampshire, and after a very short residence entered Yale College, New Haven, where he displayed a talent for versification, which gained him the friendship of Dr. Dwight, then a tutor there. Barlow, more than once during the vacations of the college, served as a volunteer in the army of the Revolution. In 1778 he received the degree of B.A., and at first applied himself to the study of the law, but soon after accepted the position of chaplain in the army, which he held till the close of the war (1783). During this period his songs and addresses were said to have animated and encouraged the soldiers; at this time, too, he planned and partly composed his *Vision of Columbus*. He went to Hartford, where, not being successful as a lawyer, he started a weekly newspaper, continuing at same time the preparation of his poem for the press. It was published in 1787, and some months after in London. To promote the sale of his poem, and that of a new edition of the *Psalms* adapted by him, Barlow gave up the newspaper and became a bookseller. In 1788 we find him in France as agent for a number of

speculators in land, called the Ohio Company. The revolution was then in progress, and Barlow went about lecturing and organizing societies in its favour. He came to England in 1791, and was deputed in the following year by the London Constitutional Society to present an address to the French Convention. In 1795 he was appointed American consul at Algiers, a post he only held for two years. Returning to Paris he made some successful commercial speculations, and acquired a considerable fortune. He returned, after an absence of seventeen years, to his native country (1805). In 1811 he was appointed minister plenipotentiary to France. In the following year, owing to the fatigues and privations of a journey to Wilna to hold a conference with Napoleon, he died (22d Dec.) at an obscure village near Craoow. His principal poem, the *Columbiad*, has never been very popular; it is defective in plan and execution, overloaded with philosophical discussions and political tirades; and disfigured by pedantic and uncouth words of his own coinage. His prose writings bear the stamp of an active and energetic intellect, but want that ripeness of judgment required by the complex nature of the subjects he examines.

BARMECIDES, a distinguished Persian family, whose virtues and splendour form a favourite subject of disquisition for Mohammedan poets and historians. Two eminent members of this family were Khaled-ben-Barmek, prime minister of Caliph Abul Abbas Al-Saffah, and tutor of the celebrated Haroun Al-raschid; and his son Yahya, grand vizier of Haroun. The expression *Barmecides Feast*, meaning a visionary banquet or make-believe entertainment, originates from a story in the Arabian Nights' Entertainments of a wealthy Barmecide, to whom a poor man, Schacabac, had applied for charity. On the latter informing him that he was starving, the Barmecide invited him to dinner; and calling for a succession of the most sumptuous viands, although none were provided, urged his guest to fall to and enjoy himself, praising the merits of each dish as it was pretended to arrive on the table. Schacabac, though suffering all the pangs of hunger, entered into the eccentric humour of his host, declared his infinite enjoyment of everything set before him, and by his patience so won the heart of his eccentric entertainer, that the latter not only provided for him immediately a real and plentiful repast, but likewise took him into his house and intrusted him with the management of his affairs.

BARMEN, a city on the Wupper, in the Prussian Rhine Province, government of Dusseldorf. The town of Barmen is formed by the union of seven villages contained in the valley of Barmen, from which it takes its name. It is contiguous to Elberfeld. It is the seat of the Rhenish Missionary Society, which has here a large seminary. The valley is remarkable for natural beauty. Barmen contains the principal ribbon manufactures on the Continent, and its ribbons are sent into all parts of the world. Next to ribbons the most important textile manufactures are zanelas or Indian cloths, satin for lining, and lace. Barmen also possesses numerous large dye-works, besides manufactures of chemicals, plated and other metal wares, buttons, yarns, iron, machines, pianos, organs, soap, &c. Pop. in 1885, 103,068; in 1890, 141,435.

BARNACLE (*Lepas*), a multivalve, hermaphrodite, and viviparous animal, belonging to the class Crustacea and sub-class (or order) Cirripedia. The various species of barnacle resemble each other in being enveloped by a mantle and shell, composed of five principal valves and several smaller pieces, joined together by a membrane attached to their circumference. The mouth, which is oval, has lateral jaws,

and along the belly, arranged in pairs, are twelve articulated and fringed *cirri* or *tentacula*. The heart is situated under the dorsal part of the animal, and the nervous system is composed of a series of small knots or *ganglia* under the belly; the gills are on the sides. The head of the barnacle is placed downwards in the shell, and the tentacula towards the superior part or orifice. Between the last pair of tentacula is a long fleshy tube, sometimes mistaken for a trunk, at the base of which, towards the back, the anus opens. The stomach has a number of small cavities, formed by its wall, which appear to perform the functions of a liver. The intestine is simple: the ovary is double, and there is a double serpentine canal through which the ova must pass; the surfaces of this canal secrete the fecundating fluid, and they are prolonged into the fleshy tube, and open at its extremity. Cuvier was the first to give an accurate account of the curious structure of these animals. The barnacles are always found attached to solid bodies, especially to rocks, timber, &c., exposed to the dashing of the waves, and even to the bottoms of ships. They feed on small marine animals, brought within their reach by the motion of the waters, and secure them by their tentacula, which are expanded and rolled up again with great celerity. They attain a very considerable size in situations where they are left unmolested, and are occasionally used as food by men. They are, in some countries, supposed to possess aphrodisiac qualities, perhaps on account of their hermaphrodite nature. We have no knowledge of the cause that originated the fable of barnacles being changed into geese; though such a fable is still in existence, and naturalists have perpetuated it by bestowing the name of *Bernicla* on a goose, and of *anserifera*, or goose-bearing (*Linnæus*), on a species of barnacle.

BARNACLE GOOSE. See BRENT GOOSE.

BARNARD-CASTLE, a town in England, county Durham, on an eminence rising abruptly from the Tees, 22 miles s.w. of Durham. The principal street is about 1 mile in length. There are here a large thread-mill and carpet manufactories. The town is now popular as a health resort. One of its attractions is the Bowes Museum and Art Gallery, endowed by private munificence, and costing with its grounds from £80,000 to £100,000. Barnard-Castle has recently been selected as the site for the Northern Counties School, an institution richly endowed, and intended to give a high class education to 300 pupils. The ruins of the castle, which stand between the northern extremity of the town and the river, form an imposing object. Portions of the walls stand on the verge of a cliff, which rises precipitously from the bed of the river Tees to the height of 70 feet, commanding an extensive view of the beautiful valley of Teesdale. The castle was originally built about the year 1178 by Bernard or Barnard Balliol, grandfather of John Balliol. Pop. in 1871, 4306; in 1881, 4098; in 1891, 4841; in 1901, 4421.

BARNAUL, or **BARNAULSKI ZAVOD**, a considerable mining town of Siberia, in the government of Tomsk, and 230 miles s.w. of the town of that name, on the Barnaulski, near its influx into the Obi. It is well built, and the streets are regular and spacious. The chief edifices are of wood. There is a mining-school, an observatory, a public library, a museum, &c. Lead is smelted from the mines in the neighbourhood; there are lime and brick kilns, a mint for copper coins, and manufactories. Pop. (1897), 29,408.

BARNES, **ALBERT**, theologian, was born in Rome, in the state of New York, December 1, 1798; died at Philadelphia, December 24, 1870. Until the age of seventeen he was employed by his father, who was a tanner, in his own occupation. At the age of twenty-

two he graduated at Hamilton College, and after studying theology at Princetown he was licensed to preach in 1824, and ordained pastor to the Presbyterian Church of Morristown, New Jersey, in February, 1826. In 1830 he was moved to the pastoral charge of the first Presbyterian Church in Philadelphia. Here he remained till his death. He is chiefly known by his *Notes on the New Testament*, published in eleven volumes between 1832 and 1848; and his *Notes on the Old Testament*, completed in 1870, which are favourite works with Sunday-school teachers and others engaged in Biblical tuition.

BARNEVELDT, JOHN VAN OLDEN, grand pensionary of Holland, a man of eminent talents and the simplest manners, an example of virtue such as history seldom presents us. He was born in 1649, and early showed himself zealous for the independence of the United Provinces, which had thrown off the yoke of Spain. As advocate-general of the province of Holland, he displayed profound views and great skill in business. The services of thirty years established his high reputation. He preserved his country against the ambition of Leicester; penetrated the secret plans of Maurice of Nassau, whom his fellow-citizens had elevated to the post of stadtholder; and his marked distrust of this prince placed him at the head of the republican party, which aimed to make the stadtholder subordinate to the legislative power. Spain at that time made proposals for peace through the archduke, governor of the Netherlands. Barneveldt was appointed plenipotentiary on this occasion, and evinced alike the skill of a statesman and the firmness of a republican. Maurice of Nassau, whose interest led him to prefer war, laboured to prevent the establishment of peace; and Barneveldt was induced only by the most urgent solicitations of the states to retain the office which had been assigned to him, and at last concluded, in 1609, an armistice with Spain for the term of twelve years, in which the independence of Holland was acknowledged. His influence now became still greater, and he was more and more an object of jealousy to the house of Nassau. The hostile spirit of the opposite parties in the state was further increased by theological difficulties. In order to prevent a civil war Barneveldt proposed an ecclesiastical council, which resolved upon a general toleration in respect to the points in question. The states acceded at first to this wise measure, but at a later period the machinations of the Nassau party persuaded them to adopt other views. This party represented the Arminians as secret friends of Spain. Barneveldt was now attacked in pamphlets, and even in the assembly of the states was insulted by the people, of whom Maurice had become the idol. Maurice insisted upon a general synod, with a view, as he pretended, of putting an end to all religious quarrels; but Barneveldt persuaded the states to oppose this measure. Troops were now levied, without the consent of Maurice, to re-establish order in the cities where the Gomarists (see ARMINIANS) had excited disturbances. On the other side, the Nassau party redoubled its attacks upon Barneveldt, who, in answer to them, published that celebrated memorial in which he warns the United Provinces of the danger which threatened them from the other party. Maurice, however, procured the assembling of a synod at Dort, in 1618, to which almost all the Calvinistic churches of Europe sent deputies. They condemned the Arminians with the most unjust severity, and Maurice was encouraged by their sentence to adopt violent measures. He caused Barneveldt and other leading men of the Arminians to be arrested; and twenty-six bribed judges condemned to death as a traitor the man to whom his country owed its political existence. On

the 18th of May, 1619, the old man of seventy-two ascended the scaffold, and suffered death with the same firmness which he had evinced under all the circumstances of his life. His two sons formed a conspiracy against the tyrant; William escaped, but Reinier was taken and executed. His mother, after his condemnation, threw herself at the feet of Maurice to beg for mercy, and to his question why she humbled herself thus for the sake of her son when she had not done it for her husband, made this memorable reply:—'I did not ask pardon for my husband, because he was innocent; I ask it for my son, because he is guilty.'

BARNSELEY, a municipal bor. of England, in the W. Riding of Yorkshire, 14 miles N. by W. of Sheffield, and 23 miles S. by E. of Leeds. It occupies the summits and slopes of two hills and is a well-built town. Among the chief buildings are the new public hall, built at a cost of over £20,000, and furnishing accommodation for various societies; the offices of the miners' association, the Beckett hospital, the county court, the offices of the Barnsley Banking Co., the parish church, St. George's Church, the congregational church, a beautiful edifice, and several other places of worship. Its staple industry is the manufacture of linen in a variety of forms, which is carried on to a great extent, both hand-loom and power-loom being used; linens are also printed here in a style similar to the cottons of Lancashire. There are numerous collieries in the neighbourhood, among which the Oaks Colliery has been made memorable by several disastrous explosions. The town possesses a beautiful public park containing several monuments. Pop. in 1891, 35,427; in 1901, 41,083.

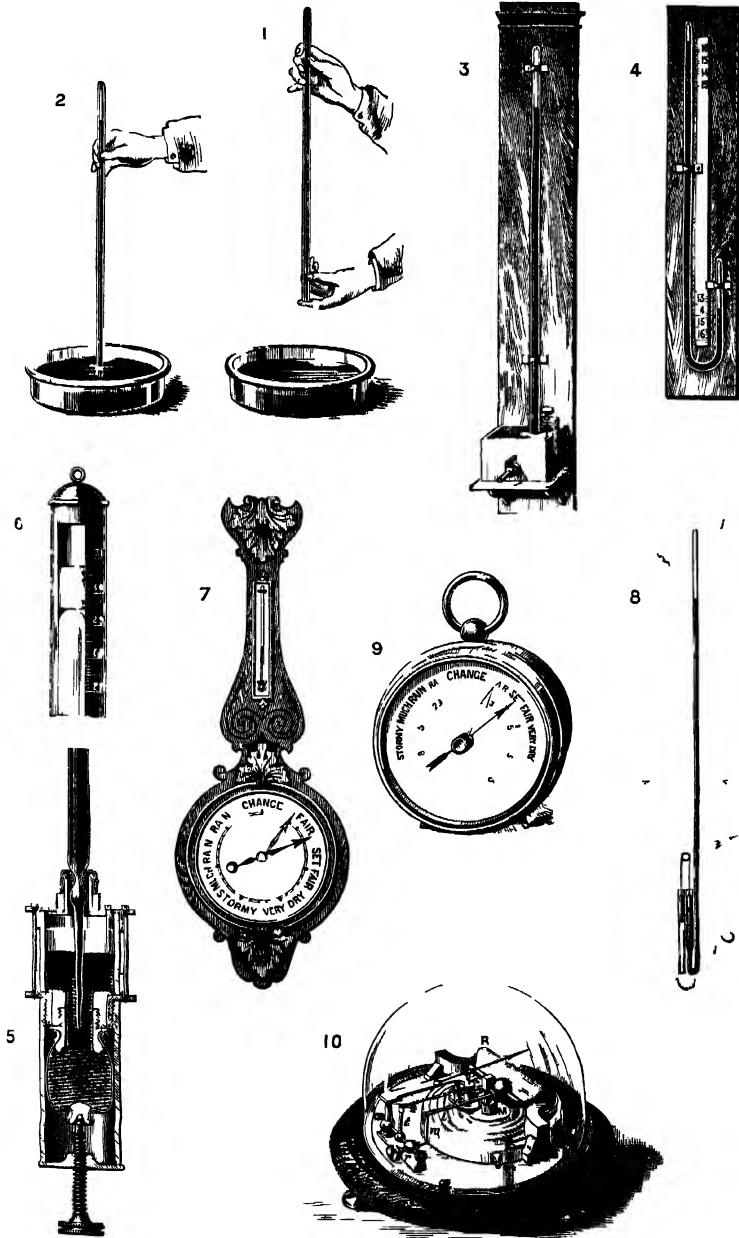
BARNSTAPLE, a municipal borough in England, county of Devon, 34 miles N.W. from Exeter, on the right bank of the Taw, which is here crossed by a handsome bridge of sixteen arches. Among its public edifices are a large and ancient Gothic church, guildhall and market buildings, the Bridge Buildings, Albert Clock-tower, &c. Its manufactures consist chiefly of lace, paper, furniture, toys, leather, gloves, and collars; and ships and boats are built. The trade chiefly depends on the surrounding district. Previous to 1885 the town returned two members to Parliament. Pop. in 1891, 13,732; in 1901, 14,137.

BAROACH. See BROACH.

BARODA, a city, Hindustan, in the province of Gujarat, capital of Baroda or the Guicowar's Dominions (which see), 240 miles north by east of the city of Bombay, on the left bank of the Viswamitra. The city proper is surrounded by a wall, outside which are large suburbs. The houses in general are very mean, but there are several palaces, some handsome houses belonging to the wealthy inhabitants, government offices, a high school, and numerous temples. It is a place of considerable trade, and the seat of a British resident. Pop. in 1901, 103,782.

BAROMETER, an instrument for measuring the weight of the air and the variations of its pressure in order to determine changes in the weather, the height of mountains, and other phenomena. This most useful instrument had its origin in an experiment of Torricelli, an Italian, who flourished about the middle of the seventeenth century; and we conceive that a short account of this experiment will be the best means of teaching the principle, while at the same time it unfolds the early history of the barometer. Torricelli took a glass tube about 3 feet in length, being open at one end only, and having filled it with mercury, he placed the open end in a cup containing the same fluid metal, taking care the while that none of the mercury flowed out of the tube, or that any air was admitted. When the tube was placed in a vertical direction, with the open end in the cup, he

BAROMETER



1. First cell's Experiment with tube full of Mercury
 2. Barometer in its simplest form
 3. Barometer with bent tube
 4. First internal structure of same
 5. Ornate portable Barometer—structural details
 6. Common Wheel Barometer or Weather Glass
 7. Aneroid Barometer
 8. Internal Mechanism of Aneroid

found that a portion of the mercury descended into the cup, the height of the column of the metal in the tube being only about 30 inches (see plate, figs. 1 and 2). It was inferred by the experimenter that the atmosphere, by reason of its weight, pressed on the surface of the mercury in the cup, and forced it up the tube to the height of 30 inches; because a column of air from the cup to the top of the atmosphere was only equal to the pressure arising from the weight of a column of mercury of the same base, and 30 inches high. Pascal repeated and varied this experiment, and confirmed Torricelli's conclusion. These experiments were made in 1645, and six years afterwards it was found by Perrier that the height of the mercury in the Torricellian tube varied with the weather; and the instrument was proposed to be employed for the measurement of the height of mountains by Boyle in 1665. The barometer in its simplest form is shown in fig. 3. The common barometer (see plate, fig. 4) consists of a glass tube 33 inches in length, the diameter of the bore being about one-third of an inch. This tube is hermetically sealed at the top, and the bottom is curved up, and open to the atmosphere. It is filled with purified mercury, and there is affixed to it a scale which marks the height of the mercurial column. In Great Britain the height of the mercury seldom passes without the limits of 28 and 31 inches; and this will, therefore, be a sufficient length for the scale of the instrument when it is only to be used as a weather-glass. The weather-points are marked thus:—At 28 inches, stormy weather; 28½, much rain or snow; 29, rain or snow; 29½, changeable; 30, fair or frost; 30½, settled fair or frost; 31, very dry weather or hard frost. But to use the barometer as a weather-glass several particulars must be attended to which have been given by different authors in the form of rules, as those of Halley, Walker, Patrick, &c. Patrick's rules are probably the best, and are as follows:—1st. The rising of the mercury presages, in general, fair weather, and its falling the contrary. 2nd. In very hot weather a fall indicates thunder. 3rd. In winter the rising presages frost, and in frosty weather, if the mercury falls three or four divisions (tenths of an inch), a thaw is certain; but in a continual frost, if the mercury rises, there will be snow. 4th. When foul weather happens soon after a fall, expect but little of it; and, on the other hand, fair weather coming quickly after a rise will probably not last. 5th. In foul weather, when the mercury rises much and high, and so continues for two or three days before the foul weather has gone away, then a continuance of fair weather may be expected to follow. 6th. In fair weather, when the mercury falls much and low, and thus continues for two or three days before the rain comes, then a great deal of wet and high winds may be expected. 7th. The unsettled motion or frequent rising and falling of the mercury denotes changeable weather. 8th. The divisions on the scale are not so strictly to be observed as the rising and falling of the mercury; for if it stands at much rain and then rises to changeable it presages fair weather, though not to continue so long as though the mercury had risen higher; and so, on the contrary, if the mercury stand at fair and then fall to changeable it presages foul weather, though not so much as if it had sunk lower. The ordinary objection to the common weather-glass is, that the scale-divisions are too small to enable one to determine correctly the amount of the variation in the height of the mercury, and various means have been adopted to remedy this defect. One of the simplest is to bend the upper part of the tube so that the part within the range of variation should slant; the mercury will thus move farther for a given change in pressure. This arrangement gives an awkward form to the instrument, and

hence the wheel-barometer was introduced. It presents more symmetry in form, and possesses the same advantage as the bent barometer in enlarging the divisions of the scale. This instrument is shown in its ordinary form and in section in the accompanying plate, figs. 7 and 8. Here the tube is bent up at the lower or open end, where a piece of glass floats on the surface of the mercury. The float is attached to a small balance-weight by a thread or small ribbon, which passes over a pulley, on the axis of which there is fixed an index-hand, which traverses the circular index-plate. The rising or falling of the quicksilver in the tube causes a similar rise or fall of the float, which by the action of the thread turns the pulley, and thus the index-hand attached to its axis will also move, and indicate the change in the altitude of the mercurial column. The friction of the additional apparatus connected with the pulley detracts from the sensibility of the instrument, and it is, therefore, unfit for purposes where great nicety is required. Formerly a rack and pinion were employed instead of the pulley and ribbon. For very delicate operations, such as the measurement of altitudes, the scale of the barometer having a straight tube is furnished with a vernier, which greatly increases the accuracy of the reading. But several other additions must be made to the barometer intended for the measurement of heights, the instrument being then called the portable barometer. Of portable barometers there are various kinds, but we shall confine our attention to that of Fortin. In the accompanying plate, figs. 5 and 6, the structural details of this instrument are shown. The cistern is formed of a tube of boxwood, surmounted by a tube of glass, and is closed below by a piece of leather, which can be raised or lowered by means of a screw. The screw works in the bottom of a brass case which incloses the cistern, except at the middle, where it is cut away in front and behind so as to expose to view the surface of the mercury. The barometer tube (see fig. 6) is inclosed in a brass tube with two slits on opposite sides, and on this inclosing tube the scale-divisions are engraved, the zero-point whence they are reckoned being the lower extremity of an ivory point fixed in the covering of the cistern. In order to determine the height of the mercurial column with precision a cylindrical sliding-piece furnished with a vernier moves in the tube at the top of the mercury. To adjust the instrument for observation, the surface of the mercury must be made by means of the screw to touch the ivory point, a condition fulfilled when the extremity of the point touches its image in the mercury, and the sliding-piece must be adjusted till it is tangential to the top of the column. When the instrument is to be carried about from place to place the screw at the bottom should be turned till the mercury reaches the top of the tube, and the instrument held in an inverted position. The chief use of the portable barometer is the measurement of the height of mountains, and it becomes in this respect an indispensable accompaniment to the scientific traveller. We shall not here go into minute details on the subject of the measurement of heights by the barometer, as the subject is treated elsewhere. We shall, however, give the rule of Sir John Leslie, which is exceedingly simple and sufficiently accurate for ordinary purposes. Mark the height of the mercury in the barometer at the bottom of the height to be measured and also at the top, then the rule is—as the sum of the heights of the mercury at the bottom and top stations is to their difference, so is 52,000 to the height to be measured, in feet. (See HEIGHTS MEASURED BY.) In barometric observations where exactness is of importance, two corrections

require to be made, one for the depression of the mercury in the tube by capillary attraction, which is in inverse ratio to the diameter of the tube; the other for temperature, which increases or diminishes the bulk of the mercury. When the tube exceeds half an inch, the correction for capillary attraction may in general be safely omitted. In siphon barometers, having both branches of the same diameter, no correction is needed. In corrections for temperature it has to be observed that both the mercury and the tube in which it is contained, as well as the scale, are liable to expansion and contraction with various degrees of heat. In taking the measurement of mountains the general rule given is to subtract the ten-thousandth part of the observed altitude for every degree of Fahrenheit above 32°. The aneroid barometer, figured in the accompanying plate (figs. 9-10), depends not on the variation in the height of a column of liquid, but on the change in form of a thin metallic vessel, partially exhausted of air. It consists essentially of a cylindrical box with a corrugated top, partially exhausted of air. At the centre of the upper surface is a small pillar *x*, connected with a powerful steel spring *n*. The rise or fall in the top of the box due to changing atmospheric pressure is transmitted by means of the levers *l* and *m* to a metallic axis *r*; and this axis carries a lever *t*, whose end is attached to a chain *z*, which turns a drum on whose axis the index-needle is fixed. The chain is kept constantly stretched by means of a spiral spring. Aneroid barometers are graduated by comparison with the mercurial barometer. They possess the great advantages of being extremely portable and very sensitive, but temperature corrections are not so easily made as in the ordinary mercurial barometer.

BARON. In the feudal system of the middle ages, at first, the immediate tenant of any superior was called his *baron*. In old records the citizens of London are so styled, and the members of the House of Commons who were elected by the cinque-ports were called *barons*. This title was introduced into England by William the Conqueror to signify an immediate vassal of the crown, who had a seat and vote in the royal court and tribunals, and subsequently in the House of Peers. It was the second rank of nobility, until dukes and marquises were introduced and placed above the earls, and viscounts also set above the barons. It is now the lowest rank of the peerage, and is held by prescription, patent, or tenure. The barons were anciently divided into *greater barons*, or such as held their lands of the king *in capite*; and *lesser barons*, such as held their lands of the greater barons by military service. In Germany the ancient barons of the empire were the immediate vassals of the crown. They appeared in the imperial court and diet, and belonged to the high nobility. But these ancient feudatories were early elevated to the rank of counts or princes.

BARON and FEME. See **HUSBAND and WIFE.**

BARONET, a hereditary dignity in Great Britain and Ireland next in rank to the peerage, originally instituted by James I., May 22, 1611. The idea was suggested by Sir Robert Cotton, and the first person to receive the honour was Sir Nicholas Bacon of Redgrave, whose successors in the title have ever since held the rank of premier baronet of the kingdom. Baronets are created by letters-patent, under the great seal, and the honour is generally given to the grantee and the heirs male of his body lawfully begotten, though sometimes it is entailed on collaterals. The order was created nominally to assist in the plantation of Ulster, but really in order to raise money for the king, and each baronet, on his creation, was obliged to pay into the treasury a

sum amounting to a little less than £1100. According to the terms of its foundation the dignity could be conferred only on those who had the right by inheritance from at least a grandfather to wear coat-armour, and whose income from lands was not less than £1000 per annum. In 1622 there were 200 baronets in England, this being the number to which the order was originally limited. Charles I. and subsequent sovereigns disregarded altogether the original limitation of the number. Precedence is given to baronets before all knights, except those of the Garter, bannerets created on the field, and privy-councillors. An order of *Baronets of Ireland* was also instituted by James I., for the same purpose and with the same privileges as the baronets of England. Since the Union, in 1801, none have been created otherwise than as baronets of the United Kingdom. Charles I. instituted an order of *Baronets of Scotland and Nova Scotia* in 1625, for the purpose of advancing the plantation of Nova Scotia, in which the king granted a certain portion of land to each member of the order. Since the Union the power of the crown to create new baronets specially connected with Scotland is held to have ceased.

BARONIUS, or BARONIO, CÆSAR, ecclesiastical historian, born at Sorra, in the Kingdom of Naples, Oct. 30, 1538; received his early education in Naples; in 1557 went to Rome; was one of the first pupils of St. Philip of Neri, and member of the congregation of priests of the oratory founded by him; afterwards cardinal and librarian of the Vatican Library. He owed these dignities to the services which he rendered the church by his *Ecclesiastical Annals*, on which he laboured from the year 1580 until his death, June 30, 1607. They comprise a rich collection of genuine documents from the papal archives, and are of great use to the student in ecclesiastical history, but contain many misstatements and unauthentic documents; and the air of sincerity which prevails throughout is calculated to give very erroneous ideas of the papal administration of the church. They were principally written to confute the Protestant controversial work called the *Centuries of Magdeburg*, and to prove that the doctrine and the constitution of the church had remained the same from the beginning. These *Annales Ecclesiastici* (a *Christo nato ad A.D. 1198*, a C. Baronio (Rome, 1588-1607, twelve vols. folio), were repeatedly reprinted, with the corrections of the author. Many errors, particularly chronological, were corrected by the Franciscan Anthony Pagi, in an excellent criticism on the work. Other Roman Catholic writers have also pointed out his errors, against which the censures of the Protestants have been more particularly directed. Among the continuations of the *Annales*, none of which is equal to the work of Baronius, Raynaldi has furnished the most copious (from 1198-1555, Rome, 1646, eight vols. folio; continued until 1671 by Laderchi, Rome, 1728, three vols. folio).

BAROTSE, a Bantu people inhabiting a region of Africa situated in the west of Rhodesia, and extending from the Chobe river northwards to the Kabompo. They are a branch of the Bechuana who have migrated northwards, and it would appear that for long they were subject to a Basuto tribe called the Makololo. About 1860, however, they threw off the yoke of their oppressors and almost exterminated them, but they still speak the language of the Makololo. Their country is a treeless, alluvial plain, over 150,000 square miles in extent. From 1890 King Lewanika acknowledged the virtual supremacy of Britain, and in 1898 the British South Africa Company obtained complete administrative powers.

BARQUISIMETO, a city in Venezuela, capital of the province of Lara, 168 miles w.s.w. Caracas. It is situated on an elevated plain, and is regularly laid out and well built. The surrounding country is fertile. Cocoa grows abundantly there, and coffee is also produced. It was nearly ruined by the great earthquake of 1812. Pop. (1888), 31,476.

BARRA, a Scottish island, belonging to Inverness-shire, and forming part of the Outer Hebrides, about 5 miles s.s.w. of South Uist. It has a length of 8 miles, with a breadth varying from 2 to 5 miles, and is almost entirely composed of gneiss, which on the w. coast forms huge rocky barriers. On these the Atlantic, beating with all its force, has hollowed out vast caves and fissures. In the interior not merely the hollows and valleys, but many of the loftiest hills are clothed with fine pasture, on which large herds of cattle and flocks of sheep are reared. The coasts abound with fish, and the island forms a fishing centre of some importance. There are many standing stones and other antiquities. Pop. in 1881, 1887; in 1891, 2181.

BARRACKPUR, a town and cantonments in Hindustan, on the left bank of the Hooghly, 10 or 12 miles N. of Calcutta. In the vicinity is the suburban residence of the Viceroy of India, within a park 4 miles in circuit. A sepoy mutiny, the prelude to the great outbreak at Meerut in May, took place here in February, 1857. A mutiny had previously taken place in 1824. Barrackpur is also known as North Barrackpur. Pop. in 1891, 20,980.—**SOUTH BARRACKPUR**, or **AGARPARA**, is situated midway between this place and Calcutta. It is under municipal government, and among its institutions are a female orphanage and school under the Church Missionary Society. Pop. (1891), 35,647.

BARRACKS, a name originally given to temporary accommodation for troops, but now designating permanent and commodious erections, in which troops are lodged in fortified towns or other places. The introduction of barracks into England met with considerable opposition as dangerous to liberty, by estranging the soldier from the citizen, and fitting him to become a tool of despotism; but these imagined dangers were found to be more than compensated by the real advantages, and since the end of the eighteenth century extensive barracks have accordingly been built at convenient stations all over the United Kingdom. As a result of the investigations of various committees of inquiry, much improvement has been effected in the construction and arrangement of barracks during the last half-century; and separate quarters are now provided for married soldiers. The construction and repair of barracks is part of the duty of the Royal Engineers; their equipment and allotment is intrusted to a barrack section of the Army Service Corps.

BARRANQUILLA, the chief commercial centre of the S. American Republic of Colombia, in the province of Bolivar, some 15 miles from the mouth of the Magdalena (the entrance of which is obstructed by a bar), and connected by a railway 18 miles long with Puerto Colombia, on Sabanilla Bay. Pop. 40,000.

BARRAS, PAUL FRANÇOIS JEAN NICOLAS, COMTE DE, member of the national convention, and of the executive directory, born at Fox-Amphoux (Var), June 30, 1755, served as second lieutenant in the regiment of Languedoc until 1775. He made, about this time, a voyage to the island of Bourbon, and entered into the garrison of Pondicherry. After serving elsewhere, he returned and squandered his fortune in dissipation. When the revolution broke out he immediately showed himself an opponent of the court, and had a seat in the tiers-état, whilst his

brother was sitting among the nobility. He took part in the attacks upon the Bastille and the Tuilleries. He was elected a jurymen at the tribunal of Orleans, and in September a member of the national convention, where he voted for the death of Louis XVI. In October he was sent with Fréron into the southern provinces, and showed himself at Marseilles less violent than he. Although he had established his reputation as a patriot, yet he displeased Robespierre, who resolved to involve him in the great proscription which he then meditated. Barras therefore joined those determined to overthrow Robespierre, and took an important part in the events of the 9th Thermidor (July 27, 1794). He was intrusted with the chief command of the forces of his party, repelled the troops of Henriot, and made himself master of Robespierre. Feb. 4, 1795, he was elected president of the convention. The 18th Vendémiaire (Oct. 5, 1795), when the troops of the sections which favoured the royal cause approached the convention, Barras for a second time received the chief command of the troops of the convention, and the battalion of the patriots, who hastened to their assistance. On this occasion he employed General Bonaparte. In his report he attributed the victory to this young general, and procured for him the chief command of the army of the interior. His important services promoted him to the directory. It is said that Bonaparte owed to him the command of the army of Italy. However this may be, Barras soon perceived that Bonaparte would give a decisive superiority to him who should obtain an influence over him; and therefore he displaced Carnot from the war department and took possession of it himself. This separated them, and Carnot for some time took part with the council, where a party had been formed to restrain the power of the directory, and particularly that of Barras. The rupture could only terminate with the ruin of one of the parties: that of the council fell by the events of the 18th Fructidor (Sept. 4, 1797), in which Barras took a leading part. From this period he governed absolutely until the 13th June, 1799, when Sidybs entered the directory. Nevertheless Barras succeeded in preserving his seat, but he became a victim of the 18th Brumaire (Nov. 9, 1799). In a letter which he sent to St. Cloud he resigned his office, and received a passport to his estate. He afterwards retired to Brussels, where he lived for several years; but finally received permission to repair to the s. of France. He died in January, 1829. His memoirs were published—both the French and the English translation—in 4 vols. in 1895-6.

BARRATOR, COMMON. See **BARRATRY** (COMMON).

BARRATRY, in commerce, any fraud or knavery committed by the master or mariners of a ship, whereby the owners or freighters are injured. The following are among the acts which have been considered barratrous, viz. evading foreign port-duties; deviation from the usual course of the voyage, by the captain, for his own private purposes, or dropping anchor, to go ashore on his own affairs; cruising against an enemy contrary to instructions; trading with an enemy, whereby the ship is exposed to seizure; wilful violation of a blockade; a wilful resistance of search by a belligerent vessel, where the right of search is legally exercised; and every negligence, when so gross as to bear a fraudulent character, is barratry; and more especially embezzlement of any part of the cargo.

BARRATRY, COMMON, is the stirring up of suits and quarrels between other persons, and the party guilty of this offence is indubitably a common barrator or barretor. But more than one instance is necessary

to constitute the offence; and any number of suits brought in the party's own name, if there be any colour for them, do not constitute this offence. The commanding of suits in the name of a fictitious plaintiff is common barratry. In Scotland barratry is the selling of justice by a judge for money.

BARRE, a town of the U. States, in Washington county, Vermont, 5½ miles south of Montpelier. It has manufactures of agricultural implements, and large granite quarries. Pop. (1890), 6312.

BARREL, a well-known variety of wooden vessel, but the term is also given to certain definite measures and weights. Thus a barrel of beer or ale is 36 gallons; a barrel of flour 196 lbs., of beef or pork 200 lbs., of butter 224 lbs.

BARREN GROUNDS, a large tract in the Northwest Territories of Canada, extending northwards from Churchill River to the Arctic Ocean between Great Bear and Great Slave Lakes and Hudson Bay. It largely consists of swamps, lakes, and bare rock, and a comparatively small part of it is yet well known. The vegetation chiefly consists of dwarf birches and willows, mosses and lichens. The animals include the reindeer, musk-ox, beaver, polar bear, wolves, foxes, &c.

BARREHEAD, a manufacturing town of Scotland, county Renfrew, in the vale and on the banks of the Levern, 7 miles s.w. of Glasgow, on the railway from Glasgow to Kilmarnock. It consists chiefly of a row of houses on either side of the public road, and is a straggling and decidedly unattractive town. The most elegant building is the Established church, in the Norman style; besides which, there are United Free, Roman Catholic, and other places of worship. The chief industries are the printing of cottons, the spinning of cotton yarn, dyeing, bleaching, iron and brass founding, and the making of machinery and sanitary appliances. Pop. in 1881, 6566; in 1891, 8215; in 1901, 9855.

BARRICADES, obstructions hastily piled up to defend a narrow passage (for instance, a street, a bridge, &c.), serving to retard an enemy and afford an opportunity of firing upon them with effect. Carriages, casks, chests, furniture, beams,—in short, everything which is at hand is used for this purpose; and if it is necessary that the enemy, when consisting principally of cavalry, should be checked in the pursuit, though it be but for a moment, the baggage wagons may be employed with effect.

BARRIE, a town of Canada, province of Ontario, 65 miles north by west of Toronto (with which it is connected by railway), on an inlet or bay of Lake Simcoe. It is picturesquely situated on a hillside sloping to the lake and is a favourite summer resort. Pop. (1891), 5550; (1901), 5949.

BARRIER REEF, a coral reef or line of reefs which extends for 1260 miles off the n.e. coast of Australia, at a mean distance from land of 30 miles. It rises precipitously from a great depth, no bottom having been found at some places with a line of 285 fathoms. This reef renders navigation dangerous, though the danger is now less since the reef has been surveyed. Inside the reef there is a good channel of about 12 fathoms deep throughout, and protected from the sea by the reef itself.

BARRIER TREATY. When, by the peace of Utrecht, the Spanish Netherlands were ceded to Austria, 1715, this session was agreed to by the Dutch, who had conquered these provinces in alliance with England, only on condition that they should have the right (in order to secure their borders and give them a barrier against their powerful neighbour France) to garrison several fortresses of the country, viz. Namur, Tournay, Menin, Furnes, Warrington, Ypres, and the fort of Kenock, and to maintain, in

common with Austria, a garrison in Dendermonde; and that Austria should engage to pay yearly to Holland 350,000 dollars for the support of these garrisons. The treaty which was concluded between Austria and Holland was called the *Barrier Treaty*. In 1781 the Emperor Joseph II. declared it void.

BARRING-OUT, a practice once common in some English schools and rendered familiar to many readers from forming the subject of one of the tales in Miss Edgeworth's *Parent's Assistant*. It generally took place a few days before the holidays, when the boys barred the doors of the school and defied the masters from the windows. The origin of the practice is not known; but the observance of it is enjoined in the statutes of Witton School, Cheshire, founded in 1588, by Sir John Deane.

BARRINGTON, DAINES, fourth son of the first Viscount Barrington, distinguished as a lawyer, antiquary, and naturalist. He was born in 1727, and after preparatory studies at Oxford and the Inner Temple, was called to the bar. He held several offices previous to his being appointed a Welsh judge in 1757; and was subsequently second justice of Chester till 1785, when he resigned that post, and thenceforward lived in retirement, chiefly at his chambers in the Inner Temple, where he died, March, 1800. His publications were numerous, but his name is now best known as a correspondent of *White of Selborne*.

BARRISTER, in England, an advocate or pleader, who has been admitted by one of the Inns of Court, viz. the Inner Temple, Middle Temple, Lincoln's Inn, or Gray's Inn, to plead at the bar. Before a student can be admitted to the bar he must have been a member of one of those societies, and have kept twelve terms there by dining sufficiently often in the hall of the society to which he belongs, and must also pass a public examination. The examinations, which had dwindled into mere forms, have been recently made more stringent. Barristers are sometimes called *utter or outer barristers*, to distinguish them from queen's (or king's) counsel, who sit within the bar in the courts, and are distinguished by a silk gown. Barristers are also spoken of as *counsel*, as in the phrase *opinion of counsel*, that is, a written opinion obtained from a barrister before whom the facts of a case have been laid. The duties of a barrister are honorary, and he can maintain no action for his fees. It is the barristers who speak before all the higher courts, being instructed in regard to the facts of the case they have in hand by means of the *brief* which they receive from the solicitor engaging their services. See *INNS OF COURT*.

BARROS, JOÃO DE, a Portuguese historian born at Viseu, 1496. He became one of the pages of the King Emmanuel, and companion of the prince royal. His first work, an historical romance, entitled the *Emperor Clarimond*, appeared in 1520. Barros presented it to the king, who urged him to undertake the history of the Portuguese in India. The king died a few months after, but his orders were executed, and this work appeared thirty-two years later. King John III. appointed Barros governor of the Portuguese settlements in Guinea, and afterwards general agent for these colonies. In 1530 he presented Barros with the province of Maranhão in Brazil, for the purpose of colonization. Barros lost a great part of his fortune by the enterprise, and returned the province to the king, who indemnified him for his losses. He died in 1570. His work *L'Azia Portuguesa* (Portuguese Asia), upon the doings of the Portuguese in India, consists of forty books. He wrote, besides, a moral dialogue, *Rhopicaneuma*, in which he shows the pernicious consequences of accommodating principles to circumstances; but this work

was prohibited by the Inquisition. He has written also a dialogue on false modesty, and a Portuguese grammar, the first ever published.

BARROSA, a village, Spain, near the s.w. coast of Andalusia, 16 miles s.s.w. of Cadiz. On a knoll to the s. of it a battle was fought in 1811, in which the British under General Graham, when abandoned by the Spaniards, defeated a superior French force under Victor.

BARROW, ISAAC, an eminent mathematician and divine, was the son of Mr. Thomas Barrow, linen-draper, of London, in which city he was born in 1680. His childhood gave no presage of his future celebrity, for at the Charter House, where he was educated, he was chiefly remarkable for fighting and neglect of study. Being removed to a school at Felsted, in Essex, he began to show some earnest of his future great reputation. He was subsequently entered a pensioner of Trinity College, Cambridge, in 1645, of which he was chosen a scholar in 1647, and took the degree of B.A. in 1648. The ejection of his uncle, the Bishop of St. Asaph, from his fellowship of Peterhouse, in consequence of his adherence to the royal party, and the great losses sustained by his father in the same cause, left him in a very unprovided condition. His good disposition and great attainments, however, so won upon his superiors, that although he refused to subscribe to the Covenant, he was very highly regarded. In 1649 he was elected fellow of his college, and finding that opinions in church and state opposite to his own now prevailed, proceeded some length in the study of anatomy, botany, and chemistry, with a view to the medical profession. He, however, changed his mind, and to the study of divinity joined that of mathematics and astronomy, unbending his mind by the cultivation of poetry, to which he was always much attached. In 1652 he graduated M.A. at Oxford, and being disappointed in his endeavour to obtain the Greek professorship at Cambridge, engaged in a scheme of foreign travel. He set out in 1655; and during his absence his first work, an edition of Euclid's Elements, was published at Cambridge. He visited France and Italy, where he embarked for Smyrna; and the ship in which he sailed being attacked by an Algerine corsair, he stood manfully to the guns until the enemy was beaten off. From Smyrna he proceeded to Constantinople, returned in 1659 by way of Germany and Holland, and was soon after Episcopally ordained by Bishop Brownrigg. In 1660 he was elected Greek professor at the University of Cambridge, without a competitor. The following year he received the degree of B.D. He was, in 1662, chosen professor of geometry in Gresham College, and in 1663 the Royal Society elected him a member of that body in the first choice after their incorporation. The same year he was appointed the first Lucasian professor of mathematics at Cambridge, on which occasion he delivered an excellent prefatory lecture on the utility of mathematical sciences. In 1669, on a conscientious principle of duty, he determined to give up mathematics and adhere exclusively to divinity. Accordingly, after publishing his celebrated *Lectiones Opticæ*, he resigned his chair to a successor worthy of him—the great Newton. In 1670 he was created D.D. by mandate, and in 1672 the king nominated him to the mastership of Trinity College, observing that he had bestowed it on the best scholar in England. He had before this refused a living, given him with a view to secure his services as a tutor to the son of the gentleman who had it to bestow, because he deemed such a contract simoniacal; and he now, with similar conscientiousness, had a clause in his patent of master, allowing him to marry, erased, because incompatible with the intentions of

the founder. In 1675 he was chosen vice-chancellor of the University of Cambridge; but the credit and utility expected from his labours were frustrated by his untimely death from a violent fever, in May, 1677, at the age of forty-seven.

The works of Dr. Barrow, both mathematical and theological, are of the highest class. Of the former, the following are the principal:—*Euclidis Elementa*, Cantab. 1655, 8vo. *Euclidis Data*, Cantab. 1657, 8vo; *Lectiones Opticæ*, Lond. 1669, 4to; *Lectiones Geometricæ*, Lond. 1670, 4to; *Archimedis Opera*; Apollonii Conicorum, lib. iv.; Theodori Sphaericorum, lib. iii., novo methodo illustrata et succincte demonstrata, Lond. 1674, 4to; *Lectio in qua Theoremata Archimedis de Sphaera et Cylindro per Methodum indivisibilium investigata*, &c., Lond. 1678, 12mo; *Mathematicæ Lectiones*, Lond. 1683. The two last works were not published till after his death. All his English works are theological; they were left in MS., and published by Dr. Tillotson, in three vols. folio, Lond. 1685. Isaac Barrow's *Opuscula* appeared in 1697, Lond. folio. As a mathematician, especially in the higher geometry, Barrow was deemed inferior only to Newton; as a divine he was singularly distinguished for depth and copiousness of thought. A fine specimen of his characteristic copiousness is quoted by Addison from his sermon on *Vain and Idle Talking*, in which the various forms and guises of wit—a faculty for which Dr. Barrow was himself celebrated—are enumerated with a felicity of expression which it would be difficult to parallel.

BARROW, SIR JOHN, BART., an eminent geographer and man of letters, was born in 1764 at Drayley-Bosc, near Ulverston, Lancashire, and when fourteen years old entered an iron-foundry in Liverpool as clerk and overlooker. Two years afterwards he gave up this situation and made a voyage in a whaler to Greenland. He was subsequently employed as a teacher of mathematics in a school at Greenwich, and in that capacity attracted the attention of Sir George Staunton, who appointed him nominally comptroller of the household to Lord Macartney in his embassy to China in 1792, though his real employment was to take charge of the philosophical instruments carried out as presents to the Chinese emperor. Of this journey he afterwards published an account under the title of *Travels in China*. On Lord Macartney being appointed governor of the Cape of Good Hope in 1797 he made Mr Barrow his private secretary; and on quitting the Cape in 1798 left him auditor-general of public accounts. During his residence there he made several journeys into the interior of South Africa, and on his return to England published an account of them under the title of *Travels in Southern Africa*. In 1804 Mr. Barrow was appointed second secretary to the admiralty. The duties of this post he discharged with the most exemplary industry and activity, and he ever took an ardent interest in promoting geographical and scientific discovery, and more especially the expeditions to the Arctic Seas. His leisure hours were employed in literary work, and the numerous volumes published by him attest the profitable use he made of his time. These include, in addition to the books of travel already mentioned, the *Life of Earl Macartney*, *Life of Lord Anson*, and a *Life of Lord Howe*, also *Voyages of Discovery and Research within the Arctic Regions*, &c. &c., besides an autobiography of himself written at the age of eighty-three. He was also an extensive contributor to the *Quarterly Review*. In 1855 he was created a baronet, and in 1845 retired from his office at the admiralty. He died on 23rd Nov. 1848.

BARROW-IN-FURNESS, a seaport, municipal, county, and parl. borough, in the district of Furness,

situated opposite to and including the island of Walney, Lancashire. The rapidity with which it has risen is scarcely paralleled among English towns. In 1848 or 1849 it was but a hamlet with 100 inhabitants, whose chief support was fishing; in 1871 its population was 17,992; in 1891 it was 51,712; and in 1901, 57,584. This extraordinary prosperity is due to the working of the rich mines of red hematite iron-ore which abounds in the district, and to the extension of the railway to Barrow, by which its excellent natural position and capabilities of development as a seaport have been taken advantage of. There are now four docks completed, giving a total water area of about 274 acres, besides a large timber-pond; the docks being fully provided with sheds, warehouses, cranes, &c. The depth of water is now sufficient to admit the largest ships at present afloat. Large graving-docks have also been constructed. Much timber is imported from the north of Europe and from Canada and Norway, large numbers of cattle are brought from Belfast, and an extensive trade is done in grain and flour. Iron-ore and pig-iron are largely shipped from the port. There is a large passenger traffic with the Isle of Man and Belfast. The chief industrial occupations of the town are the manufacture of iron and Bessemer-steel, ship-building, iron-founding, and the making of ropes, sails, bricks, &c. Large jute-works, paper-pulp works, and salt-works have been established, giving employment to very many hands. Barrow owes a great deal of its prosperity to the discovery of the Bessemer process of steel-making, and to the fact that the hematite ores of the district are specially adapted to this process. Most of the ore was sent elsewhere to be smelted till 1857, when Messrs. Schneider and Hannay erected four blast-furnaces. This number was afterwards increased to fourteen; a large Bessemer-steel work being added. The yearly output of pig-iron is said to be 350,000 tons, with 200,000 tons of Bessemer and Siemens-Martin steel. Messrs. Vickers, Sons, and Maxim, Limited, employ some 8000 persons, and have built some of the largest merchant and war-vessels afloat. They also manufacture ordnance. The chief imports are timber, coal, jute; the exports, ore, steel rails, and pig-iron. The town is laid out on a regular plan, mostly in rectangles, is substantially built, and well drained and supplied with gas, water, and electricity. It contains churches, chapels, and schools for the various denominations, a free public library, workmen's institute, and a town-hall, built at a cost of over £60,000. The Redistribution Act of 1885 erected it into a parliamentary borough, returning one member. The interesting ruins of Furness Abbey, which was founded in 1127, lie within two miles of the town.

BARROWS. See **TOWNS.**

BARRY, a seaport of S. Wales, county of Glamorgan, 7 miles s.w. of Cardiff. It has been practically brought into existence by the construction (1884-89) of a dock of 70 acres area here, between Barry Island and the mainland, at a cost of about £850,000, the entrance being between two breakwaters respectively 2600 and 700 feet in length. Barry possesses churches and chapels, market-hall, public-hall, seamen's institute, &c., and carries on a large export trade in coal. Pop. (urban sanitary district), in 1891, 13,278; in 1901, 27,028.

BARRY, SIR CHARLES, a distinguished architect, was born in London on 28rd May, 1795. At a very early age he displayed a taste for drawing and design, and while quite a youth, and apprentice to a firm of surveyors, he exhibited at the Royal Academy. Having resolved to devote his energies to architecture, he employed the little property left him in visiting Italy, Greece, and the East. He left Eng-

land in 1817, and remained abroad upwards of three years. After his return he entered on his professional career. He executed numerous important buildings, such as the Traveller's and Reform Club-houses, London; St. Edward's School, Birmingham, &c.; and in 1836 was appointed architect of the new Houses of Parliament at Westminster. On this building his fame as an architect rests, and with its execution he was employed almost unintermittently to the day of his death, extending over a period of more than twenty-four years. In 1852 he received the honour of knighthood. He had been admitted a Royal Academician in 1841. He died suddenly in May, 1860. As an architect Sir Charles Barry belonged to the eclectic school, and adopted indifferently the Gothic or classic styles according as he might be required or circumstances render it expedient.—His son EDWARD MIDDLETON (1830-80), who had been trained as an architect and had already distinguished himself in his profession, succeeded to his father's business, and completed his great work the Houses of Parliament. He designed a large number of buildings, many of them of national magnitude and importance. He was elected a Royal Academician in 1869, and in 1878 succeeded Sir G. G. Scott as professor of architecture to the Academy.

BARRY, JAMES, a painter and writer on art, was born at Cork in 1741, and died in 1806. By one of his first paintings in oil, exhibited at Dublin, he attracted the attention of Burke, who carried him, in his twenty-third year, to London. The brothers Burke provided him with the means for visiting Paris and Rome, from whence he went to Florence, Bologna, and Naples. He remained about four years in Italy, returning in 1770. Having exhibited some important pictures he was elected an associate of the Royal Academy in 1772, and a full academician the following year. In 1777-83 he executed his chief work, the paintings which adorn the great hall of the Society of Arts. In 1775 he published *An Inquiry into the Real or Imaginary Obstructions to the Increase of the Arts in England*. He was appointed professor of painting to the Academy in 1782; but in 1799, after he had alienated the respect of his fellow-academicians by his peculiar manners, and by his savage attacks upon them, he was expelled on the occasion of a violent pamphlet issued by him under the title of a *Letter to the Society of Dilettanti*. He was distinguished more by vigour of conception than by accuracy of execution, and his paintings have not maintained their reputation.

BARRY, MARIE JEANNE COMTESSE DU, born at Vaucouleurs, in France, in 1744, of low parentage, the mistress, and finally the procuress of Louis XV. Nothing can convey a stronger impression of the degraded state into which the French court had fallen during the reign of that worthless and licentious monarch than the influence which this woman possessed at it, and the fulsome adulation which courtiers of the most illustrious descent were mean enough to pay her. In the latter part of her life, however, she showed that better feelings were not wholly extinguished in her, by the interest she took in the fate of the royal family at the revolution. She perished on the scaffold in 1793.

BARRY, JOHN, a distinguished naval officer of the United States, born in the county of Wexford, Ireland, in 1745. He was brought up to the sea, though his father was a farmer; and after going to America (at the age of fourteen or fifteen) he continued in this line of life. The reputation which he had acquired for skill and experience procured for him one of the first naval commissions from Congress. After a successful cruise in the *Lexington*, a 16-gun brig, he was transferred, in the latter part of 1776, to the

Effingham, one of three large frigates built in Philadelphia. When the American vessels of war were lying near Whitehill, whither they had been sent when the city and the forts of the river had fallen into the power of the British, Commodore Barry conceived the daring plan of annoying the enemy by means of small boats, properly armed, which being stationed down the river and bay might intercept supplies, and in case of danger take refuge in the creeks. He accordingly manned the boats of the frigates, descended the river with muffled oars under cover of the night, and appeared unexpectedly before the city. He effected his object by intercepting a large stock of provisions, and capturing several vessels laden with military munitions and valuable stores for the British officers. He was afterwards named commander of a seventy-four building in New Hampshire; but, this vessel having been presented by Congress to the King of France, he was transferred to the *Alliance*, a frigate of 86 guns, which was placed under his orders. December 25, 1781, the *Alliance* sailed from Boston with the Marquis de la Fayette and Count de Noailles on board, who were proceeding to France on public business. During the rest of the war Barry served with credit to himself and benefit to his country, and after the cessation of hostilities, was appointed to superintend the building of the frigate *United States* in Philadelphia, which was designed for his command. He retained the command of the *United States* until she was laid up in ordinary. After a life of usefulness and honour, Barry fell a victim to an asthmatic affection, at Philadelphia, September 13, 1803.

BARBARAS was son of Alpheus, brother of James the Less and of Jude, and was one of the candidates nominated for the apostolical office left vacant by the treachery and suicide of Judas. According to tradition he was afterwards appointed Bishop of Eleutheropolis, a town of Palestine, about 20 miles from Jerusalem, and suffered martyrdom. Another Barbaras, surnamed Judas, and supposed to be the brother of the above, is mentioned in the Acts as one of the companions of Paul and Barnabas when they went to preach the gospel at Antioch. He is supposed to have returned to Jerusalem, and died at a very advanced age.

BAR-SUR-AUBE, a town of France, department of Aube, 29 miles E from Troyes, on the Aube, here crossed by a bridge, in a valley, surrounded with vine-clad hills. Pop. (1891), 4306.

BART, JEAN. See BAERT.

BARTAN, or BARTIN, a town of Asia Minor, in the vilayet of Kastamuni, at the junction of the river Barten and a smaller stream, the Barten (which is navigable for small vessels) entering the Black Sea a few miles below. It is surrounded by a ruinous wall, and consists of about 800 houses, and is built on two low hills of cretaceous limestone. The houses, on account of the marshy character of the surrounding country, are all built of two stories, the upper one of which alone is inhabited. For the same reason the streets are carefully paved with large limestone slabs. It has several mosques, khans, and baths; and carries on a lively trade with Constantinople, from which it imports various kinds of merchandise, sending in exchange hemp, fruit, and building-timber. Pop. 4000.

BARTFA, or BARTFELD, a free town, Hungary, county of Saros, 156 miles N.E. of Budapest, on a rising ground near the banks of the Tisza and Lauka. It is one of the oldest towns in Hungary, and is well built; has several Roman Catholic churches, a Lutheran church and school, a Franciscan monastery, military academy, hospital, theatre, paper-mills, potteries, &c. Some acidulous chalybeate springs

and baths, near the town, are much frequented. The trade in wine, hemp, linen cloth, and woollen yarn is considerable. Pop. (1890), 5069.

BARTH, HENRIKH, a distinguished geographer and African traveller, was born at Hamburg, Feb. 16, 1821. He received his education partly in his native town, and partly at the University of Berlin, where he graduated as Ph.D. in 1844. Having determined to explore all the countries bordering on the Mediterranean, he set out with this intention in the beginning of 1845. After his return in the end of 1847 he wrote an account of his travels, which he published with the title *Wanderungen durch die Küstenländer des Mittelmeeres* (vol. i. Berlin, 1849). In less than two years after his return from his first travels he was invited by the English government to join Dr. Overweg in accompanying the expedition that was about to proceed under Mr. Richardson to Central Africa. The expedition having landed at Tripoli in the end of 1849, set out thence for the interior of Africa in February, 1850. His explorations, which extended over an area of about 2,000,000 square miles, hitherto almost entirely unknown, were continued for more than five years. In spite of the death both of Mr. Richardson and Dr. Overweg, and he did not return to Tripoli till the autumn of 1855. The chief geographical results of these travels consist in the light they throw on the true nature of the Desert of Sahara, in showing that the eastern upper branch of the Niger, the Benuwe, is not connected with Lake Tchad, and in the determination of the course of the Niger between Say and Timbuctoo. The work which he wrote on these travels, entitled *Travels and Discoveries in North and Central Africa*, was published in English in 1857-8 (5 vols.). Immediately after its publication he set out upon a new series of travels through the countries bordering on the Mediterranean, the last of which occupied the summer of 1865. He died 25th November, 1865. Besides the works mentioned, he published an important work on the languages of the countries he had visited in Africa, entitled *Sammlung und Verarbeitung central-afrikanischer Vokabularien* (Gotha, 1862-3), but it was left unfinished.

BARTHELEMY, JEAN JACQUES, born January 20, 1716, at Cassis, near Marseilles, in what was formerly Provence, received a good education from the fathers of the oratory at Marseilles, and was about to prepare himself, under the Jesuits, for holy orders; but becoming disgusted with his teachers, he declined all offers of clerical promotion, and only accepted the title of *abbé*, in order to show that he belonged to this class. From his youth he loved the study of the ancient languages, including the ancient Oriental tongues, and antiquities more particularly. His indefatigable industry and acuteness soon enabled him to communicate to the learned new discoveries in this branch of study, among which the Alphabet of Palmyra, published by him in 1764, holds a principal place. In 1747 he was chosen member of the Academy of Inscriptions at Paris, after having been associated, on his arrival in Paris (1744), with the inspector of the Royal Cabinet of Medals. About this time he became acquainted with the Count Stainville (afterwards the minister Choiseul), who was on the point of departing as ambassador for Rome, and invited Barthélemy to accompany him thither. Having been appointed director of the Cabinet of Medals in 1753, he accepted the offer, and went in 1754 to Rome. He travelled through Italy, collected antiquities, and occupied himself, after his return, with learned works, and with the arrangement of the cabinet which had been intrusted to his care, and to which he added a great

number of costly and rare medals. Among his works none are so distinguished for learning and beauty of description as the *Travels of the Younger Anacharsis* in Greece, on which he had laboured thirty years, and which was translated into English, German, and other languages. He himself was modest enough to call this an unwieldy compilation, whilst all the learned men of France and foreign countries received it with the greatest applause. Barthélemy, in his advanced age, resolved to compose a complete catalogue of the Royal Cabinet of Medals, but was interrupted in 1788 by the storms of the revolution. In 1789 he received a place in the Académie Française. In 1793 he was arrested on a charge of aristocratic leanings, but he was soon after set at liberty. This event had the most injurious effects upon his weak health. When the chief librarian of the national library, the notorious Carra, was executed, October 31, 1793, Barthélemy received the offer of his place; but he refused it, with the hope of passing his few remaining days in tranquillity. He died January 30, 1795.

BARTHÉLEMY-SAINT-HILAIRE, JULES, French politician and philosopher, was born at Paris on Aug. 19th, 1805. On completing his studies he received an appointment in the ministry of finance, being at that time also on the staff of the *Globe* newspaper. After the revolution of 1830 he founded a journal called *Bon Sens*, and continued to support the liberal party in the press. In 1834 he became examiner in French literature at the *École Polytechnique*, and four years later he was appointed to the chair of Greek and Latin philosophy in the *Collège de France*. He played a part on the side of the moderate party in the revolution of 1848, and was elected to the constituent assembly for *Seine-et-Oise*. The *coup d'état* of December, 1852, caused him to forsake political life for a considerable time and to resign his professorship. From this retirement he emerged in 1869, the year of his election as deputy for the first circumscription of *Seine-et-Oise*. He was shortly afterwards sent to the National Assembly as the representative of that department, and during the troublous times of 1870-71 he was closely associated with M. Thiers. In 1875 he became a life senator, and in the cabinet of M. Jules Ferry, constituted 1880, he was appointed minister of foreign affairs. The chief event of his tenure of this office was the occupation of Tunis. In 1881 he again abandoned public life for study and literary work. He died at Paris on Nov. 25th, 1895. His greatest work is his complete French version of Aristotle (1837-1893); and among his other writings are *De la Logique d'Aristote* (1838); *Des Védas* (1854); *Du Bouddhisme* (1855); *Letters on Egypt* (1856); *Le Bouddha et sa Religion* (1862); *Mahomet et le Coran* (1865); *De la Métaphysique* (1879); *L'Inde Anglaise* (1887); *Victor Cousin* (1895, 3 vols.); and other works on Hindu religions, philosophy, &c.

BARTHEZ, PAUL JOSEPH, one of the most learned physicians of France in the eighteenth century, was born at Montpellier, December 11, 1734. He completed his medical studies and received the degree of M.D. in 1753, and in 1754 he came to Paris, where he was received into the society of Barthélemy, D'Alembert, and other eminent men. Two memoirs which he presented to the Académie des Inscriptions et des Belles-Lettres, obtained the first prizes. Recalled to Montpellier, he founded there a medical school, which acquired a reputation throughout all Europe. He also published there his *Nouveaux Éléments de la Science de l'Homme* (Montpellier, 1773; 2nd augm. ed., Paris, 1806, 2 vols.), which was translated into most of the European languages. He returned in 1780 to Paris, where he

was appointed by the king consulting physician, and by the Duke of Orleans his first physician. The revolution deprived him of the greater part of his fortune and his place. Napoleon, who understood how to discover merit, brought him forth again, and loaded him in his advanced age with dignities. He died December 15, 1806. His name will be remembered with the same respect as those of Boerhaave, Hoffmann, Sydenham, Cullen, Brown, &c. Among his numerous writings may be specially mentioned the *Nouvelle Mécanique des Mouvements de l'Homme et des Animaux*.

BARTHOLOMEW (son of Tolmai), the apostle, is probably the same person as *Nathanael*, mentioned in the Gospel of St. John as an upright Israelite, and one of the first disciples of Jesus. The derivation of his name and descent from the family of the Ptolemies is fabulous. He is said to have taught Christianity in the south of Arabia, into which, according to Eusebius, he carried the Gospel of St. Matthew in the Hebrew language. Chrysostom mentions that he preached in Armenia and Asia Minor, and tradition tells that he was flayed alive and crucified with his head downward. The ancient church had an apocryphal gospel bearing his name, of which nothing has been preserved. His day is the 24th August.

BARTHOLOMEW, ST., one of the Leeward Islands, in the West Indies, 120 miles to the N.W. of Guadeloupe, belonging to France (to which power it was transferred by Sweden in 1877), about 8 square miles in area, and rising to the height of about 1000 feet. It produces tobacco, sugar, cotton, indigo, cassava, drugs, &c., with some excellent woods (including *lignum vite*), and limestone. All the fresh water which can be procured is saved in cisterns, as there are no springs. The climate is healthy. The island is encompassed by formidable rocks, which render it dangerous of access to shipping. Pop. (1889), 2674. The only town is Gustavia or St. Bartholomew, and the only harbour is that of Gustavia.—There are two other islands of the same name in the South Pacific Ocean.

BARTHOLOMEW FAIR, a celebrated fair formerly and for many years held in West Smithfield, London, on St. Bartholomew's Day (Aug. 24, O.S.). It was first established in the reign of Henry I., and was originally devoted mainly to the purposes of business and traffic. Sports, exhibitions, and popular amusements were also introduced, among them being the mysteries and miracle plays of the church. In process of time the transacting of serious business was gradually superseded, and the chief attraction of the fair consisted in shows and other amusements. Latterly even these declined in quality, and the institution came to be regarded as a nuisance, subversive of order and morals. After many discussions on the propriety of abolishing the fair, this was finally effected in 1855.

BARTHOLOMEW'S DAY, ST., a feast of the Christian Church, celebrated in honour of St. Bartholomew on 24th August. The horrid slaughter of the Huguenots, in France, took place on St. Bartholomew's Day, under the reign of Charles IX., in 1572. The causes which produced it may be found in the articles *HUGUENOTS*, *GUISES*, and *CONDÉ*. After the death of Francis II., Catherine de' Medici had assumed the regency for her son Charles IX., then only ten years old, and was compelled, in spite of the opposition of the Guises, to issue an edict of toleration in favour of the Protestants. The party of the Guises now persuaded the nation that the Catholic religion was in the greatest danger. The Huguenots were treated in the most cruel manner; Prince Condé took up arms; The Guises had recourse

to the Spaniards, Condé to the English, for assistance. Both parties were guilty of the most atrocious cruelties, but finally concluded peace. The queen-mother caused the king, who had entered his fourteenth year, to be declared of age, that she might govern more absolutely under his name. Duke Francis de Guise had been assassinated by a Huguenot, at the siege of Orleans; but his spirit continued in his family, which considered the Admiral Coligny as the author of his murder. The Huguenots soon found that the queen-mother still hated them; and Condé and Coligny therefore kept themselves on their guard. The king (see CHARLES IX.) had been persuaded that the Huguenots had designs on his life, and had conceived an implacable hatred against them. Meanwhile, the court endeavoured to gain time, in order to seize the persons of the prince and the admiral by stratagem, but was disappointed, and hostilities were renewed with more violence than ever. In the battle of Jarnac, 1569, Condé was made prisoner and shot by the Captain de Montesquieu. Coligny collected the remains of the routed army; the young prince Henry de Béarn (afterwards Henry IV., king of Navarre and France), the head of the Protestant party after the death of Condé, was appointed commander-in-chief, and Coligny commanded in the name of the prince Henry de Condé, who swore to revenge the murder of his father. But he was destitute of means, and was unsuccessful. The advantageous offers of peace at St Germain-en-Laye (August 8, 1570) blinded the chiefs of the Huguenots, particularly the Admiral Coligny, who was wearied with civil war. The king appeared to have entirely disengaged himself from the influence of the Guises and his mother: he invited the old Coligny, the support of the Huguenots, to his court, and honoured him as a father. The most artful means were employed to increase this delusion. The sister of the king was married to the Prince de Béarn (Aug. 18, 1572), in order to allure the most distinguished Huguenots to Paris. Some of his friends endeavoured to dissuade the admiral from this visit; but he could not be convinced that the king would command an assassination of the Protestants throughout his kingdom. Aug. 22, a shot from a window wounded the admiral. The king hastened to visit him, and swore to punish the author of the villany; but, on the same day, he was induced by his mother to believe that the admiral had designs on his life. 'God's death!' he exclaimed: 'kill the admiral; and not only him, but all the Huguenots; let none remain to disturb us!' The following night, Catharine held the bloody council which fixed the execution for the night of St. Bartholomew, August 24, 1572. After the assassination of Coligny, a bell from the tower of the royal palace, at midnight, gave to the assembled companies of burghers the signal for the general massacre of the Huguenots. The Prince of Condé and the King of Navarre saved their lives by going to mass, and pretending to embrace the Catholic religion. By the king's orders, the massacre was extended through the whole kingdom; and if, in some provinces, the officers had honour and humanity enough to disobey the orders to butcher their innocent fellow-citizens, yet instruments were always found to continue the massacre. This horrible slaughter continued for thirty days, in almost all the provinces: the victims are calculated at 80,000. At Rome, the cannons were discharged, the pope ordered a jubilee and a procession to the church of St. Louis, and caused the Te Deum to be chanted. Those of the Huguenots who escaped fled into the mountains and to Rochelle. The Duke of Anjou laid siege to that city, but, during the siege,

received the news that the Poles had elected him their king. He concluded a treaty, July 6, 1573, and the king granted to the Huguenots the exercise of their religion in certain towns. The court gained nothing by the massacre of St. Bartholomew (called, in French ultra papers, in 1824, *une rigueur salutaire*). The Huguenots were afterwards more on their guard, and armed themselves against new attacks. (See Hist. de la Ste. Barthélémy d'après les Chroniques, les Mémoires et les Manuscrits du Tems, Paris, 1826. The massacre of St. Bartholomew is, in this work, attributed to Catharine de' Medici. See also Schiller's History of the Troubles in France, until the death of Charles IX.)

BARTHOLOMEW'S HOSPITAL, ST. one of the greatest hospitals of London; formerly the priory of St. Bartholomew, and made an hospital by Henry VIII. in 1547. It contains 676 beds, and, on an average, 6000 patients are annually admitted to the hospital, while about 100,000 out-patients are relieved by it.

BARTLETT, WILLIAM HENRY, a well-known artist, was born at Kentish Town, London, on 29th March, 1809, and afterwards served an apprenticeship with the distinguished architectural antiquary Mr. John Britton, who conceived a high opinion of his pupil's powers, and employed him to make drawings for his Cathedral Antiquities and Picturesque Antiquities of English Cities. Mr. Bartlett subsequently travelled extensively abroad, and the illustrative works which he published, descriptive of the countries visited by him, obtained great success with the public. The engravings in these are taken from sketches by his own pencil, and display a wonderful beauty and richness of execution. Among those more especially deserving of notice are his works on Switzerland, Syria, Egypt, and the United States of America. He died on the voyage from Malta to Marseilles, on 25th September, 1864.

BARTOLINI, LORENZO, a celebrated Italian sculptor, was born at Florence about 1778. In his youth he was a pupil of Desmarests, a French painter, and made considerable progress under him; but the bent of his genius leading him rather to handle the chisel than the brush, he proceeded to Paris, and entered the studio of the sculptor Lemot. He early established his reputation by the execution of a bas-relief, Cleobis and Biton. Napoleon intrusted him with a multitude of works, among others a colossal bust of the emperor placed above the entrance of the French Institute, and a magnificent statue of him, which, in consequence of the events of the restoration, was never delivered to government, and is now in America. On the fall of the empire he returned to Florence, where he continued to exercise his profession. Among his greater works may be mentioned his groups of Charity, and Hercules and Lycas, and the beautiful monument in the cathedral of Lausanne, Switzerland, erected in memory of Lady Stratford Canning, who died there in 1817. Bartolini ranks next to Canova among modern Italian sculptors. He died at Florence in 1850.

BARTOLOMEO, FRA. See BACCIO DELLA PORTA.

BARTOLOZZI, FRANCESCO, a distinguished engraver, born at Florence in 1725, or, according to others, in 1730, where he learned the art of drawing from Hufgrot, Ferretti, and others. In Venice, in Florence, and Milan, he etched several pieces on sacred subjects, and then went to London, where he received great encouragement, and accommodated himself entirely to the national taste, so as even to work in the popular red dotted manner. His pieces were so universally sought for, that a complete collection of them was valued at £1000. He was elected a

member of the Royal Academy of Arts, in London. After forty years' residence in London, he went to Lisbon, to engrave on copper the portrait of the regent, where he received, in 1807, the order of Christ. He died there in April, 1813. With accuracy of design, he united great delicacy of execution. Among his best engravings is the death of Lord Chatham, after Copley, and the Virgin and Child. His works, among which are imitations in etching of drawings of the great masters, amount to more than 2000.

BARTOLUUS, one of the most celebrated lawyers of his century, was born at Sasso Ferrato, in the Marches of Ancona, about 1813; studied and took his degree of Doctor of Law at Bologna, became professor, first at Pisa, and then at Perugia, was enriched and honoured with other distinctions and privileges by the emperor Charles IV., and not only published many important works in law, in which his opinions were long deemed almost oracular, but distinguished himself in various other branches of knowledge. His excessive labours appear to have undermined his constitution, and he died at Perugia in 1566.

BARTON BERNARD, known as the Quaker poet, one of the minor English poets of the nineteenth century, was born in London, 31st January, 1784. In 1806 he removed to Woodbridge, in Suffolk, where he entered into a business in coals and corn, along with a brother of his wife; but his partner dying, he gave up this occupation, and in 1810 became clerk in a bank at Woodbridge, a situation which he held till not long before his death. He died of heart disease on the 19th February, 1849, leaving a daughter, his only child. In 1824 a reading society founded by him at Woodbridge presented him with £1200, and he afterwards received a pension of £100 through Sir R. Peel. His first appearance as an author was in 1812, when he published a small volume of poems under the title of *Metrical Effusions*, which led to a correspondence with the poet Southey. This was followed in 1818 by *Poems by an Amateur*, and in 1820 by a volume entitled simply *Poems*, which became popular, and gained him the friendship of Lamb and Byron. Of his other productions the chief were *Napoleon*, and other *Poems* (1822); *Poetic Vigils* (1824); *Devotional Verses* (1826); *A New-year's Eve*, and other *Poems* (1828); besides many contributions to the annuals and magazines. His last work was *Household Verses* (1845). His daughter Lucy published *Selections from the Poems and Letters of Bernard Barton*, in 1849. His poetry, though deficient in force, is pleasing, fluent, and graceful, animated by a love of nature, and by a pure religious spirit.

BARTON, ELIZABETH, a country girl of Aldington, in Kent (commonly called the Holy Maid of Kent), who was used as an instrument, by the Catholics and adherents of Queen Catherine, to excite the English nation against the proposed divorce of Henry VIII from his first wife, and the apprehended separation of the English church from Rome, with which the king then threatened the pope. Her delirious utterances, in a violent nervous illness, were made use of by the parson of Aldington, Richard Maister, and by a canon of Canterbury named Bocking, to persuade her that she was a prophetess inspired by God, and destined to prevent this undertaking of the king. Among other things she prophesied that Henry, if he persisted in his purpose of divorce and second marriage, would not be king for seven months longer, and would die a shameful death, and he succeeded by Catherine's daughter. Her revelations, published and distributed by the monk Dering, produced such a fermentation among the people, that Henry ordered

the apprehension and examination of Elizabeth and her accomplices before the Star-chamber. After they had there confessed the imposture, they were condemned to make a public confession and to imprisonment; and the Maid, Bocking, Maister, Dering, and three others were afterwards adjudged guilty of high treason, for a conspiracy against the king, and executed April 21, 1534. The venerable Bishop Fisher and Sir Thomas More were among those accused of holding correspondence with the Holy Maid; and the former was pronounced guilty of misprision, or concealment, of treason in consequence.

BARTON-ON-HUMBER, a town of Lincolnshire, England, on the Humber, an ancient place, with two old churches, one of them, in part at least, an undoubted specimen of Saxon architecture. Its industries embrace ropes, manures, candles, cement, cycles, &c. Pop. (1891), 5226; (1901), 5671.

BARUCH (literally *blessed*), is used as the name of several individuals, of whom the most celebrated was the son of Neriaah, scribe and assistant to the prophet Jeremiah. During the reign of Jehoiakim, about B.C. 607, Jeremiah, while in prison, having been divinely commissioned to put all his prophecies in writing, dictated them to Baruch, who inserted them in a roll, which he was ordered to read both within and at the entrance of the temple. Jehoiakim on hearing its commencement cut it in pieces and threw it into the fire. At the captivity, after the destruction of Jerusalem, Jeremiah and Baruch were permitted to remain in Palestine, but were afterwards carried into Egypt, B.C. 588. The subsequent life of Baruch is little known. According to one tradition he died in Egypt, according to another, he quitted Egypt for Babylon, and died there twelve years after Babylon was destroyed. One of the apocryphal books bears the name of Baruch. The Council of Tront gave it a place in the canon, but its authenticity was not admitted either by the ancient Jews or the early Christian fathers.

BARYTA, one of the earths; from *barys*, heavy, on account of the high specific gravity of its compounds. It is procured either from the native sulphate of barium, by exposing its powder to a red heat with charcoal, and by forming from the resulting sulphuret a nitrate, which is decomposed by heat; or from the native carbonate, by dissolving it in nitric acid, and, in like manner, subjecting it to heat. Thus obtained, baryta has a specific gravity of 4, is of a gray colour, has a caustic taste, and alkalies on exposure to the air, like lime, falling to powder from the absorption of water. It is soluble in 25 parts of water, at 80°, and in the proportion of nearly half its weight at 212°. The solution, on cooling, affords prismatic crystals. Its watery solution possesses strong alkaline properties, changing the vegetable blues to green, and acquiring a film upon its surface, when exposed to the air, from the absorption of carbonic acid. It operates as a virulent poison when taken into the stomach. To the flame of alcohol it imparts a greenish yellow colour, which, together with its great solubility in water, serves to distinguish it from the other earths. It is used in chemical analysis, for decomposing minerals such as silicates, and thus rendering them soluble in acids or water.

Baryta was decomposed by the agency of galvanism, and ascertained to be the oxide of a peculiar metal, to which Sir Humphry Davy gave the name of *barium*. Barium has a white colour, with a metallic lustre, resembling that of silver. Exposed to the air or thrown into water, it absorbs oxygen, and is converted into baryta.

Baryta combines with the acids, and forms a variety of salts, two of which, the carbonate and the sulphate, are found abundantly in nature. The first

of these is called, in mineralogy, *Witherite*, from Dr. Withering, its discoverer. It is commonly fibrous or bladed in its structure, occasionally including small cavities lined with minute crystals. It is whitish, translucent, and glistening. Specific gravity, 4.3. It is composed of baryta 78, and carbonic anhydride 22. Like all the other salts of baryta (with one exception), the carbonate is a virulent poison, and has often proved fatal to domestic fowls and animals which have accidentally swallowed it, about the mines where it occurs. Its principal localities are in the north of England, where it is found in lead mines: it also occurs in Styria, Salzburg, and Siberia. It is used to obtain the pure baryta, and those salts of this earth which are employed as chemical tests, and for the purposes of scientific illustration.

The sulphate of barium, called, in mineralogy, *heavy spar*, is found abundantly in almost every country, usually accompanying galena, or common lead-ore, of which it frequently forms the gangue. It is often beautifully crystallized under a variety of forms, derived from a right rhombic prism of $101^{\circ} 42'$, and $78^{\circ} 18'$, but is more generally lamellar or compact. It presents numerous colours, of which white is the most frequent. It is translucent, and sometimes transparent, capable of being scratched by the knife, and of a specific gravity of 4.7. Like the artificial sulphate of barium, it is insoluble, and is the only salt of this earth which is not poisonous. It consists of 67 parts of baryta and 33 sulphuric anhydride. It is employed, though less extensively, for the same purposes as the carbonate, and was formerly used by Mr. Wedgwood in the manufacture of his beautiful jasper ware.

A fibrous variety of heavy spar, called *Bolognian mass*, which occurs, imbedded in small nodular masses, in a marl near Bologna, has the remarkable property of becoming phosphorescent by calcination.

The *artificial* sulphate of barium formed by adding sulphuric acid to any soluble compound of barium, is a heavy white powder insoluble in acids and alkalies, and is the usual test by which barium is recognized. It is also employed for painting in water-colours, under the name of *permanent white*. The same substance is much valued for marking bottles in chemical laboratories, where the acid vapours destroy common ink, and for labelling articles kept in cellars and moist places. In order to be applied, it is mixed up with spirits of turpentine and linseed-oil, to the consistence of common paint, when it is laid on with a brush. If a black marking material is preferred, this may be rendered so by the addition of a little lamp-black.

The *nitrate of barium* is formed by dissolving the native carbonate in diluted nitric acid, and crystallizes on evaporation. It is soluble in 10 or 12 parts of water, at 60° , and in 3 or 4 parts at 212° .

The *chloride of barium*, in like manner, is produced by submitting the carbonate to the action of dilute hydrochloric acid. It is much more soluble than the nitrate. The chloride of barium is employed with advantage as a medicine, in the treatment of scrofulous diseases, though, from its poisonous nature, great caution is required in its administration. With the other acids barium forms compounds which are insoluble in water, but dissolves more or less readily in hydrochloric acid.

When baryta is raised to a dull red heat in the air it combines with an additional quantity of oxygen, and is converted into the barytic peroxide. If this compound be then heated to full redness the additional quantity of oxygen is given off and baryta remains. By taking advantage of this property it was hoped that oxygen might be got continuously

from the air on a sufficient scale for manufacturing purposes. But although the process succeeded, the expense attending the working of it has hitherto prevented it being employed as a convenient source of oxygen, and even in the laboratory it has not superseded the potassic chlorate.

BASAITTI, MARCO, a celebrated early painter of Greek extraction, born in the Friuli about the middle of the fifteenth century, settled in Venice, where several of his paintings, remarkable for the brilliancy of their colouring, and distinguished by other excellences, are seen. His master-piece, now in the Venetian academy, is the Calling of St. Andrew and St. Peter. He was the contemporary, and not unfrequently the successful rival, of Gian Bellini.

BASALT. See TRAP-ROCKS.

BASCINET, or **BASNET**, a light helmet, sometimes with, but more frequently without a visor, and worn by knights at times when, though apprehension of danger was not imminent, it might not have been safe to be altogether unarmed. It resembled a basin, and hence its name. It was in general use for English infantry in the reigns of Edward II. and III., and Richard II., and is frequently mentioned in parliamentary and other public records.

BASE, in architecture, see ARCHITECTURE; in chemistry, see CHEMISTRY.

BASE, or **BASIS**, a term in tactics, first introduced into military language by Heinrich von Bulow, who laboured to reduce war to mathematical principles, and to give more certain rules to the commander. By *basis*, he understands a tract of country well protected by fortresses, and from which the operations of the army proceed. The line on which these operations are executed he calls the *line of operation*; the fortresses from which the operations begin, the *subject*; the point to be first carried, the *object*. Thus, in an offensive war of France against South Germany, supposing Prussia and Switzerland to be neutral, the Rhine, from Basel to Karlsruhe, would have been the *basis*; Strasburg, the *subject*; Ulm, or Ratisbon, the *object*; and the road from Strasburg to these places, the *line of operation*. As Bulow thought magazines indispensable, the security of the line of operation against all attacks from the side seemed to him likewise indispensable, and he laid down the principle that both the lines drawn from the ends of the *basis* to the *object*, ought to meet there in a right or an obtuse angle, the last being preferable. The novelty and importance of the *subject*, and the severity with which Bulow criticized his opponents, gave rise to a violent dispute. In 1814, the *subject* was discussed in the *Fragmente aus den Grundsätzen der Strategie*, erläutert durch die Darstellung des Feldzugs in Deutschland, 1796; a most valuable work, composed by the Archduke Charles of Austria. He adopts many of the ideas of Bulow, and rejects others; and, on the whole, establishes the theory of the *basis* on such grounds, that every unprejudiced military man will be disposed to admit it. He also maintains, that the *basis* (according to his definition, a straight line, which unites several points at which the stores of the army are collected) must be covered. It ought, since the operation on one road would be dangerous, to include, if possible, several fortified places, connected by easy communications, and to run parallel with the *basis* of the enemy. If the troops move too far from the *basis* a new one should be formed. The archduke explains his principles on a supposed theatre of war in the south of Germany, and by the war which actually took place in that country in 1796, in which he distinguished himself so much. Several of the European wars have shown the correctness of this theory, which has been acted on, more or less, by generals in

all ages, and the neglect of which has generally been attended with suffering and defeat. Thus the Prussians, in 1792, advanced without paying regard to the fortresses of Mentz, Thionville, Landau, &c., on one line of operation; and were nearly destroyed at Valmy; and, for the same reason, the army of Jourdan, in 1796, was almost entirely ruined, after some unfortunate engagements. So the army of Napoleon perished in Russia, because he had not formed, before advancing to Moscow, a new basis on the Dnieper. The war in Spain, also, westward of Madrid, consisted only of detached movements of large columns, which were ineffectual, on account of the want of a proper communication. The allies also were enabled to march from all sides against Napoleon at Leipzig, in consequence of his having neglected to form a basis at Dresden; and they themselves were several times exposed to the greatest danger in France, from a similar neglect, when nothing but the boldness of Blücher, and the spirit of the troops, saved them. It may be objected, that Napoleon owed his greatest glory to campaigns in which he entirely disregarded the basis; as those of 1805 and 1809, against Austria, and his previous campaigns in Italy; but one single great and decisive battle lost would have punished severely his neglect of this principle. And, moreover, there is one rule still more important than those of tactics—to act according to the circumstances and the character of the enemy, and to bring on decisive results by energetic measures, rather than to moulder away in inaction. We may remark, also, that the conquest of the capital of a large state is always a most important object, and should be aimed at as speedily as the rules of tactics will allow.

BASEDOW, JOHN BERNHARD, often called by himself *Bernard von Nordaltingen*; one of the most famous of the German teachers, who, in the latter half of the eighteenth century, wrote so much on education, was born Sep. 11, 1723, died July 25, 1790. He had in Dessau an institution for education, called *Philanthropion*, which the prince of this territory favoured. The chief features of Basedow's system are the cosmopolitan character which he endeavoured to instil into his pupils, and the full development of the faculties of the young at which he aspired, in pursuance of the notions of Locke and Rousseau. With Salzmann, Campe, &c., he established some good institutions, and particularly deserves credit on account of his efforts for the education of the lower classes.

BASEL, or BASE (Fr. *Bâle*), one of the largest cities of Switzerland, and capital of canton Basel City, 43 miles N. of Bern. It consists of two parts, pleasantly situated on opposite sides of the Rhine, and communicating by a long wooden bridge; is walled, and though irregular, tolerably well built; and has an ancient cathedral, conspicuous both by its elevated site and lofty towers, and justly regarded as one of the finest ecclesiastical edifices in Switzerland. Basel was formerly a free imperial city, but joined the Swiss Confederacy in 1601. Buxtorf, Wetstein, Hermann, the Bernoullis, and Euler were born in Basel. Erasmus also lived there several years, and lies buried in the cathedral. Among the institutions of the city are the university, founded in 1459; various collections of paintings, a seminary for missionaries, and a German Bible society, which prints stereotype Bibles, and distributes several hundred copies of every edition to the poor. In 1849 a large museum was completed, which contains the university library (now consisting of about 80,000 vols., with 4000 manuscripts), and all the collections belonging to the town. At one time it was a remarkable peculiarity of Basel, that the

clocks were an hour in advance of those of other places; and the streets of the city were not lighted until March, 1826. The manufactures are extensive, consisting principally of ribbons, and more partially of other silk goods, cotton prints, linen, gloves, leather, jewelry, and turnery ware. The advantageous position of Basel on the Rhine, a little below the point where it becomes navigable, and at the terminus of the French and German railways, has made it a centre of trade, and starting-point for travellers in Switzerland. Pop. (1900), 112,842.

BASEL, COUNCIL OF. This council was announced at the Council of Constance, and convoked by Pope Martin V., and his successor Eugenius IV. It commenced its sittings Dec. 14, 1431, under the presidency of the cardinal legate Julianus Cesarini of St. Angelo. The objects of its deliberations were to extirpate heresies (that of the Hussites in particular), to unite all Christian nations under the Catholic church, to put a stop to wars between Christian princes, and to reform the church. But its first steps towards a peaceable reconciliation with the Hussites, against whom Julianus had unsuccessfully published a crusade, were displeasing to the pope, who authorized the cardinal legate to dissolve the council. That body opposed the pretensions of the pope, with severe animadversions on his deceitful conduct, and his neglect of the welfare of the church, and, notwithstanding his repeated orders to remove to Italy, continued its deliberations under the protection of the emperor Sigismund, of the German princes, and of France. In order to secure itself against the attacks of Eugenius IV., it re-enacted the decrees of the Council of Constance concerning the power of a general council (in matters of faith, of schism, and of reformation), to command the pope, as well as all Christendom, and to punish the disobedience of the clergy, and even of the pope, by virtue of its judicial character as the representative of the Universal Church. It likewise pronounced all the doings and remonstrances of the pope against its proceedings of no force, and began a formal process against him, after he had issued a bull for its dissolution; appointed him, term after term, to appear before its tribunal, and exercised as much as possible the papal prerogatives in France and Germany. Meanwhile it concluded, in the name of the church, a peace with the Hussites (whose deputies appeared, Jan. 6, 1433, with 800 horse, in Basel, by which the use of the cup in the communion was granted to them. This peace was ratified, Nov. 20, 1433, by the Calixtines, the most powerful and finally prevailing party of the Hussites. The council deviated on this point, indeed, from the decrees of the Council of Constance, but was obliged so to do, in order to assist its most faithful protector, the emperor Sigismund, to the acquisition of Bohemia by this compromise with the Hussites, who were not to be subdued by force. The emperor, in return, effected the reconciliation of the council with Eugenius IV., who, urged by an insurrection in the papal territory, and by the fear of losing all authority in Germany and France, solemnly confirmed its decrees in a bull, dictated by the council, and accepted at the sixteenth session (Feb. 5, 1434). Proud of this victory over the pope, it attempted to interfere in the quarrels of the German princes; but was reminded by Sigismund, who protested against its intermeddling in the affairs of the crown, of its proper point—the reformation of the church. Towards the limitation of the power of the pope, in accordance with the ancient constitution of the church, it had already made an important step by depriving him of the disposal of the prebends of cathedral and collegiate churches, which had been obtained by his

predecessors; by restoring to the chapters the free election of their officers, and by obliging the pope to confirm them gratuitously. It proceeded to the reformation of the clergy, by ordaining that the clergymen who maintained concubines, and the prelates who received money for permitting it, should be punished; that the excommunicated should not incur the penalties of their sentence before its publication; that interdicts should never be granted at the request of single individuals; and that repeated appeals should not be allowed on account of their complaints (twentieth session, Jan. 22, 1435); that the *annates*, the sums paid for the *pallia*, &c., should be regarded as simoniacal, and should not, under any pretext, be demanded or paid in future; that the divine service, the mass, and the canonical hours should be regularly observed by the clergy of each class; that disturbances of public worship should be prevented by a good ecclesiastical police; that the Feast of Fools, and all irreverent celebrations customary in the church about Christmas, should be abolished (twenty-first session, June 9, 1436). In the twenty-third session (March 25, 1438) the form of election, the confession of faith, and the official oath of each pope, by which he bound himself to obey the decrees of the council, and the annual repetition of the same, were provided for; all preferment of the relations of a pope was forbidden, and the College of Cardinals was limited to twenty-four prelates and doctors of all nations, who should be elected by the free votes of the college, should be entitled to half of the revenues of the States of the Church, should watch over the pope, and always sign his bulls. They granted him only the right to dispose of the prebends belonging to the diocese of Rome, and abolished the investiture of church preferments in reversion. In the twenty-sixth session it again summoned him to appear, on account of his disobedience of its decrees, declared him guilty of contumacy, and, after Eugenius had opened his counter-synod at Ferrara, decreed his suspension from the papal chair, in the thirty-first session (Jan. 24, 1438). In the same session it forbade appeal to Rome, without resort to the intermediate jurisdictions, left to the papal disposition but one out of ten, and two out of fifty prebends of a church, and destined the third part of all canonries which might become vacant to men who had taken regular degrees. The removal of Eugenius, however, seemed, on account of the strength of his party, so impracticable, that some prelates, who till then had been the boldest and most influential speakers in the council (for example, the cardinal legate Julianus, and the great canon Nicholas of Cusa, Archdeacon of Liege, with the most of the Italians), left Basel, and went over to the party of Eugenius. The Archbishop of Arles, Cardinal Louis Allemand, a man of superior spirit, courage, and eloquence, was now made first president of the council, and directed its proceedings with much vigour. Although its number was diminished, its most powerful protector, the emperor Sigismund, deceased, and its authority doubted by several princes and nations, on account of its open rupture with the pope; yet, in the thirty-third session (May 16, 1439), after violent debates, in which the Archbishop of Palermo, Nic. Tudeschi (known, under the name of *Panormitanus*, as the greatest canon of his time), who was the delegate of the King of Arragon and Sicily, took the part of the pope,—it declared Eugenius, on account of his obstinate disobedience of its decrees, a heretic, and formally deposed him, in the following session, as guilty of simony, perjury, violation of the laws of the church, and bad administration in his office. At this session (the thirty-fourth, June 25, 1439), only two of the Spanish and Italian members were present;

but the president adopted a spirited and effectual method for obtaining the decrees. He ordered the holy relics which existed in Basel to be placed in the seats of the absent bishops, and produced such a strong excitement in the council, which still consisted of 400, for the most part French and German prelates, priests, and doctors, that it unanimously consented to the deposition of Eugenius. Notwithstanding the plague, then raging in Basel, which continually diminished its number, it proceeded, in a regular conclave (Nov. 17 of the same year), to elect the duke Amadeus of Savoy to the papal chair. This prince then lived in retirement at Ripaglia, on the Lake of Geneva, and seemed particularly qualified for the office, on account of his piety, his riches, and his connections. But Felix V.—this was the name he adopted—was acknowledged by only a few princes, cities, and universities. The chief powers, France and Germany, assented to the decrees of the council for the reformation of the church, but they chose to remain neutral in the contest with Eugenius. Meanwhile he acquired new credit by the union concluded with the Greek deputies at Florence (but afterwards rejected by the Greek Church) and the friendship of the emperor Frederic III. The council, on the other hand, denounced by Eugenius, and deserted by its protectors, gradually declined under its feeble pope, and, consulting only appearances and the personal safety of its members, held its forty-fifth and last session, May 16, 1443, after an inaction of three years, interrupted only by a few insignificant decrees. At this session the place of meeting was changed to Lausanne. Here some prelates remained together under the cardinal Louis Allemand, until 1449, when, after the death of Eugenius and the resignation of Felix V., they gladly accepted the amnesty offered by the new pope, Nicholas V., and pronounced the council closed. The decrees of the Council of Basel are admitted into none of the Roman or official collections, and by the Roman church are considered of no authority. They have been regarded, however, as of authority in points of canon law, in France and Germany, as their regulations for the reformation of the church were to some extent adopted in both countries, and, as far as they regard clerical discipline, were actually enforced. Some concordats, concluded at subsequent dates, have modified the application of them, but never formally and entirely annulled them. No general council has ever issued more just and suitable decrees for the reformation of the papal government, and of clerical discipline; none has done more to restore the authority of the bishops, which the imperious pretensions of the popes had almost annihilated, and, consequently, the ancient apostolical constitution of the church; but the canonists, who almost entirely conducted the council, could not disengage themselves from the idea of the universality of the episcopal character of the pope; and, proceeding on these premises, their strongest measures for restricting his power were incomplete, and all their attempts at reformation practically useless. If this council had accomplished its chief object—the conversion of the papal monarchy into a hierarchical aristocracy—many sources of complaint against the papal despotism would indeed have been removed; but the reformation of Luther, in the sixteenth century, would probably not have been prevented.

BASEL, TREATIES OF PEACE AT: April 5 and July 22, 1795. The former was signed by the Prussian ambassador, afterwards chancellor of state, Baron Hardenberg (which see); the latter by the Spanish ambassador, Marquis D. Domingo d'Yriarte; and both by the minister plenipotentiary of the French republic in Switzerland, the citizen Barthélemy. By these

treaties Prussia and Spain separated themselves from the coalition against France, and acknowledged the republic. The republic retained the Prussian provinces on the left bank of the Rhine until the general peace, and accepted the mediation of Prussia when any German princes wished to conclude separate treaties of peace with it. A secret article was inserted in the treaty, the object of which was to secure compensation to Prussia, in case the left bank of the Rhine should remain with France at the general peace. The Landgrave of Hesse-Cassel afterwards concluded a treaty with the French republic at Basel, August 28, 1795, by which the latter retained possession of the territories of Hesse-Cassel on the left bank of the Rhine until the general peace. By the peace of Basel all the conquests of the republican army beyond the Pyrenees were restored to Spain, in exchange for which it ceded to France the Spanish part of the island of St. Domingo. The Spanish prime minister, D. Emano Godoy, Duke of Alcudia, received, as a reward for this treaty, the title of *Prince of the Peace*.

BASHAN (meaning uncertain, perhaps *soft, rich soil*) is the name in Scripture for a singularly rich tract of country lying beyond the Jordan between Mount Hermon and the land of Gilead. These two regions, Bashan and Gilead, attracted the attention of those tribes that desired to continue the pastoral life to which they and their fathers had been accustomed; and Gilead was accordingly divided between Reuben and Gad, while Bashan was given to the half-tribe of Manasseh. Modern travellers speak with enthusiasm and delight of its forests, in which oaks abound worthy to be set aside by side with the cedars of Lebanon; and the 'strong bulls of Bashan' of ancient times are still represented by the vast herds of black-cattle which pasture on its fertile slopes. Bashan had been the kingdom of the Canaanite giant Og whom Moses destroyed; and one district of the country, Argob, had at that time sixty fenced cities, with walls, gates, and bars, beside unwall towns a great many. These were standing or restored in Solomon's days; and to this day there are many points from which the traveller can see the remains of more than half that number. Among the cities of this region were Edrei, Konath, Golan, and Bozrah. After the captivity it is mentioned as divided into Trachonitis (the ancient Argob), Gaulanitis (Golan), Auranitis (Hauran, mentioned by Ezekiel), and Batanea, or Bashan proper.

BASHAW. See **PASHA**.

BASHEE ISLANDS, or **BATANES**, a group of small islands in the Chinese Sea, discovered by Dampier in 1687, and now forming a dependency of the Philippines, north of which they are situated, midway between Luzon and Formosa. The largest island is Batan, with a population of about 8000. Two others are also of some size, but a number of the members of the group are very small, some being mere rocks. The total population of these islands is about 11,000. The productions are plantains, bananas, pine-apples, sugar-cane, potatoes, yams, and cotton. Their quadrupeds are chiefly goats and hogs.

BASHI-BAZOUKS, irregular troops in the pay of the Turkish sultan. They are a wild, turbulent body of men, mostly from Turkey in Asia, and in the duties with which they are entrusted resemble the Cossacks in the Russian army. On the formation of the Turkish contingent during the Crimean war, in 1855, the British government enlisted a number of Bashi Bazouks, but before they could be rendered effective peace was concluded. In the spring of 1876 the Bashi-Bazouks were guilty of great atrocities in checking a threatened insurrection in the district round Philippopolis in Eastern Roumelia.

BASHKIRS, or **BASHKEERS**, a tribe of people subject to Russia, and inhabiting the banks of the Ural and Volga. They are probably descended from the Nogay Tartars, and resemble them in their manners. They formerly roamed about, under their own princes, in Southern Siberia. To avoid the Siberian khans, they settled in their present territory, extended themselves along the Volga and the Ural, and submitted to the Khan of Khassan. At the time when this state was overthrown by Ivan II, they voluntarily took refuge under the Russian sceptre; but their frequent revolts long prevented their increase, and kept them in a weak condition. They number about 500,000, and inhabit chiefly the governments of Orenburg, Perm, and Samara. They are Mohammedans, and live chiefly by hunting, the breeding of cattle and horses, and keeping of bees. They prepare from fermented mare's and camel's milk an intoxicating beverage, *kumis*, which is their favourite drink. They are little civilized. The Bashkirs furnish the Russian army with a body of irregular cavalry, who formerly made use of the bow and arrow, but are now equipped with weapons of modern type.

BASIL, Bishop of Ancyra in 336, violently opposed the Arians, but having been convicted of entertaining semi-Arian views, was excommunicated by the Council of Sardica in 347. He still, however, retained his see, and secured a sanction of his opinions from a council held at Ancyra in 358, but was finally deposed in 360. Both St. Basil and Athanasius seem to have considered him substantially orthodox, though his modes of expression tended to mislead.

BASIL, St., called the *Great*, to distinguish him from other patriarchs of the same name, was born in 329, and made in 370 Bishop of Cæsarea in Cappadocia, where he died in 379. He is the most distinguished ecclesiastic among the Grecian patriarchs. His efforts for the regulation of clerical discipline, of the divine service, and of the standing of the clergy; the number of his sermons; the success of his mild treatment of the Arians; and above all, his endeavours for the promotion of monastic life, for which he prepared vows and rules, observed by himself and still remaining in force, prove the merits of this holy man. The Greek Church honours him as one of its most illustrious patron saints, and celebrates his festival on Jan. 1. The widely-spread order of Basilian monks are named after him. They lead an ascetic life. The vows of obedience, chastity, and poverty framed by St. Basil are the rules of all the orders of Christendom, although he is particularly the father of the eastern, as St. Benedict is the patriarch of the western orders.

BASILICA (literally, a royal hall, originally the hall occupied by the *archôn basilæus* or 'king archon' amongst the ancient Athenians), the name of buildings belonging to classical antiquity, which acquired their characteristic form among the Romans. In the first centuries of the Christian era the Roman basilicas were splendid public buildings, of an oblong shape, commonly adorned with columns and with statues, where the citizens collected to consult for their common welfare, the merchants exposed their wares, young orators exercised themselves in declamation, &c. Constantine the Great gave some basilicas to the Christians in Rome for their worship. Thence it happened that the first Christian churches obtained the name of *basilicae*. But in the fourth century after Christ the ancient form of the basilica began to be modified, and to receive further developments. The chief changes that from that time onwards were gradually made in its construction consisted in the raising of the nave above the rest of the building, the introduction of upper windows, the addi-

tion of the transepts, and the decoration of the interior with works in mosaic. At a later time towers were introduced, and still later vaulted roofs instead of the flat timber roofs with which they were formerly provided.

BASILICA, a code of laws founded on the code of Justinian, supposed to have been named after the Greek emperor Basilus I., in whose reign its compilation was begun. It was finished by Leo the Philosopher, and revised by order of his son Constantine Porphyrogenitus in 945. It consisted of 60 books, but we no longer possess them in a complete form. The principal editions are those of Fahrot (7 vols., Paris, 1847), and Heimbach (vols. i-v. Leipsic, 1833-50).

BASILIDES, founder of one of the most remarkable sects of ancient Alexandria, lived under the reigns of Trajan, Adrian, and Antoninus, but the place of his birth, supposed to be either in Persia, Syria, or Egypt, is unknown. He was well acquainted with Christianity, but under the pretence of freeing it from corruption, corrupted it still more by mixing it up with the wildest dreams of the Gnostics, and peopling the earth and the air with multitudes of *æons*. He had numerous followers, who spread from Syria and Egypt into Italy, and even as far as France, but they suddenly sank into obscurity, and are scarcely heard of after the fourth century.

BASILISK. The basilisk of the ancients, according to Pliny (lib. viii. cap. 21), was a kind of serpent found in the African deserts, named *basiliskos*, or *little king*, because its body was marked with bright spots, and those on the head had the appearance of a crown or diadem. It had a very pointed head, with fiery eyes, and was of a dark colour, crying to blackness. All other snakes were said to fly from the sound of its hissing; and instead of trailing along like other serpents, the basilisk raised its body nearly erect, and, as it passed along, killed the herbs and fruits by its touch, and even by its breath! Yet this monster was destroyed by weasels. If these fables had reference to any real animal, it is probable that it was a species somewhat similar to the *cobra de capello*, or the asp viper. The *cobra de capello* has a mark on the back of its head, though more like a pair of spectacles than a crown: both it and the asp are accustomed to erect a very considerable part of the body, though not to move forward in this way. It is highly probable that the basilisk of the ancients was merely a creature of fiction.

The name basilisk is now applied to a genus of saurian reptiles, of the family Iguanidæ, and distinguished from other genera belonging to it by the absence of a loose and dilatate skin under the throat, and of thigh pores, and by the presence of a remarkable crest running continuously along its back and tail. This genus includes only two species—the hooded basilisk (*Basiliscus mitratus*) and the crested basilisk (*B. Amblydenis*). The former is distinguished chiefly by the largeness of the bag or hood on its occiput, which, when filled with air, is about the size of a chicken's egg. Its whole length is about 26 inches, but of these only 7 or 8 are occupied by the head and back, and all the rest by a long compressed tail. The crested basilisk receives its name of *Amblydenis* from its abundance in the island of Ambouyna, and indeed generally in the Indian Archipelago. It is above 3 feet long, of a green colour, with stripes, which on the head and neck are white, on the back and tail brown, and on the belly of whitish silvery hue. It frequents the sides of rivers and fresh-water ponds, often basking among the trees which overhang them, and dropping suddenly down into the water on any appearance of danger.

Being both stupid and timid, it is easily caught. Its flesh is wholesome, white and tender as a chicken, and tastes like venison. (See plate at REPTILES.)

BASILIVS I., a Macedonian who, though born of poor parents about the beginning of the ninth century, ultimately rose to be Emperor of Constantinople. Having arrived in that city for the first time, in his twenty-fifth year, he gained the favour of an archimandrite, who procured him service with an officer of the court of the emperor Michael III. His good fortune still attended him, and from the service of the officer he passed to that of his imperial master, and was appointed head-chamberlain. A patrician named Bardus, who was related to Michael, having become jealous of the influence of Basilus, was plotting his downfall, but Basilus anticipated him, and charged Bardus with conspiracy. Bardus cleared himself; but Basilus continued to advance so rapidly in the emperor's favour, that he shortly after was adopted as his colleague. The Macedonian's ambition was not yet satisfied, and knowing that Michael had rendered himself odious by his cruelty and debauchery, he headed a body of conspirators, and murdered him in his bed in 867. Basilus had worked his way to the throne by a series of crimes, but proved an able and equitable sovereign; paid equal attention to the internal administration and the foreign relations of the empire, and not overlooking even its religious interests, sent an archbishop into Russia, and laid the foundation of that ascendancy which the Greek Church has so long possessed in that country. The versatility, if not the depth of his intellect, is strikingly displayed in his Exhortations to his Son Leo, which are still extant. His death, in 886, was caused by a blow given him by a stag while he was hunting.

BASILIVS II., on the death of his father, the emperor Romanus the Younger, in 963, was kept out of the succession for twelve years by two usurpers, the first, Nicephorus II. (Phocas), who died in 969, and the second, Johannes (John) Zimisceus, who associated Basilus and his brother Constantine with him in the empire in 975, and died the following year, leaving the whole power to Basilus, although Constantine was still his colleague in name. His reign was almost a continued scene of warfare, in which the contending parties seemed to vie with each other in committing deeds of cruelty, but was extended for the unusual period of fifty years. He died in 1025.

BASIN, a term of comparatively recent use in physical geography, is generally used in relation to rivers, lakes, and seas, and designates not only the ground actually covered by them, but the whole area of the countries which send their drainage to them. Thus, for example, the basin of the Baltic means not merely the expanse of water to which that name is given, but all those parts of Germany, Russia, Sweden, and Denmark drained by rivers and lakes which discharge themselves into the Baltic. The boundary between two basins, formed for the most part by a ridge or plateau interposed between them, and sending the waters which descend from its sides in opposite directions, is called the watershed. In geology the term basin is sometimes employed to designate, not an area of drainage, but an area occupied by a particular formation. Thus we speak of the Paris basin and the London basin. In a still more restricted sense, a coal-field is sometimes designated a coal-basin, because in many cases the area over which coal-seams extend has more or less of the shape of a basin.

BASINGSTOKE, a town and parish of England, in the county of Hants. The town, pleasantly situated near the source of the Loddon, 18 miles

W.S.M. from Winchester, consists of several streets lined with well-built houses, paved, amply supplied with water, and lighted. A handsome new town-hall was erected here in 1832, containing a spacious market for corn, a ball-room, and other apartments for public purposes. Basingstoke has a church, a fine Gothic structure erected in the time of Henry VIII.; several other places of worship; a mechanics' institute, with good library; and numerous charities founded by private persons. A considerable trade is carried on in corn and malt. Population of municipal borough in 1891, 8213; in 1901, 9793.

BASKERVILLE, JOHN, an English artist, deserving of notice for his improvements in printing and type-founding. He was born at Wolverley, in Worcestershire, in 1706, and, inheriting a small estate, was brought up to no profession. He, however, acquired a particular skill in penmanship and carving letters on stone; and at the age of twenty he settled at Birmingham as a writing-master. He subsequently engaged in the manufacture of japanned works; and in 1750 commenced his labours in the branch of art which acquired for him so much celebrity. His first great performance as a printer, was an edition of Virgil, in royal 4to, 1756, which was followed by many of the Latin classics, and some English ones, in 4to and smaller sizes. The beauty of his typographical productions was superior to anything which had previously appeared from an English press; and when it is considered that the paper and ink, as well as the types and workmanship, were the fruits of one man's skill and ingenuity, it must be admitted that he possessed great merit. He died in 1775, and his types and matrices were afterwards sold at Paris for £3700, to Beaumarchais.

BASLE. See **BASEL**.

BASNAGE, a family of French Protestants, remarkable for the number of able men and eminent writers whom it has produced.—1. **NICOLAS**, who having espoused the doctrines of the Reformation, was compelled by persecution to take refuge in England, where he became the minister of a congregation at Norwich. When, by the accession of Henry IV., a better era began to dawn he returned to his country, and officiated till his death as the minister of a church at Carentan.—2. **BENJAMIN**, son of the former, born in 1580, succeeded his father in his charge, and held it for the long period of fifty-one years. He long held a prominent place among the reformers of France, presided in the assembly held at Rochelle in 1622, undertook the dangerous task of negotiating for English aid, travelled into Scotland to arouse the Protestant feeling in that country, and on his return took the lead in the important synods held at Charonton in 1623 and 1631, and at Alençon in 1637. His principal work, entitled *Traité de l'Eglise*, is a good specimen of his talents. He died in 1652.—3. **HENRI DE FRANQUENAY**, born in 1615, died in 1695, youngest son of Benjamin, studied for the bar, and as a provincial advocate in Rouen long stood at the head of his profession. His eloquence, learning, and unswerving integrity secured him the esteem, not only of the Protestants, whose views he held, but even of those most violently opposed to them. His complete works, confined to juridical subjects, were published at Rouen, in 2 vols. folio, in 1778.—4. **JACQUES**, eldest son of Henri, born at Rouen in 1653, is the best known, and perhaps the ablest member of the family. At Saumur he became the favourite pupil of Tanaquil le Fèvre, who would fain have dissuaded him from studying for the church; but his resolution, previously avowed, was not to be shaken, and he completed his course of theology by studying, first at Geneva and afterwards at Sedan. On his return, in 1676, he became minister of the Protestant

church at Rouen. In 1685, the bigotry of Louis XIV. having closed his church, he removed to Holland, and officiated as minister, first, for a short period, at Rotterdam, and then permanently at the Hague. Although he had been tyrannically driven from his home, so high was the opinion entertained both of his ability and integrity, that when the French government were anxious to form a coalition with England and the United Provinces, one of the leading instructions given to their ambassador was to take the advice of Basnage, and be guided by it. On this and on other occasions Basnage showed that had worldly aggrandizement been his object, he could easily, as a statesman, have outstripped his fame as a divine. He died in 1728. His works are very numerous, and some of them having been called forth by the circumstances of the times have lost much of the interest which originally attached to them; but several of them are still standards on the subjects of which they treat. Among others may be mentioned *Histoire de l'Eglise*, 2 vols. folio; *Histoire des Juifs*, 15 vols. 12mo; *Annales des Provinces Unies*, 2 vols. folio; and *La Communion Sainte*, 12mo.

BASQUES, or **BISCAYANS**, in their own language, *Euzaldunac*; a remarkable race of people dwelling in the south-west corner of France, and in the north of Spain, on both sides of the Pyrenees. They are probably descendants of the ancient Iberi, who occupied Spain before the Celts. The French Basques (Gascons) settled, at the end of the sixth century, on the north side of the Pyrenees, between those mountains and the Garonne. After long struggles they submitted to the kings of the Franks. Under the Carlovingian race they elected their own dukes, but, after the extinction of that family, they fell under the dominion of Aquitania in the eleventh century, and with it under that of France in 1453. The Basques preserve their ancient language, former manners, and their national dances, and make admirable soldiers, especially in guerilla warfare, to which their native temperament inclines, and their frequent expeditions in carrying on the smuggling, to which they are much addicted, inure them. They are very good seamen, and were the first Europeans who engaged in the whale-fishery, which they have, however, long since relinquished. They occupy, in Spain, the provinces of Biscay, Guipuzcoa, and Alava; in France, the departments of the Upper and Lower Pyrenees, Ariège, and Upper Garonne. See **BISCAY**.

BASS (from the Italian *basso*, deep, low), the lowest part in the harmony of a musical composition. It is the most important of all the parts, the foundation of the harmony, and the support of the whole composition.—*Figured bass* is a bass which, while a certain chord or harmony is continued by the parts above, moves in notes of the same harmony. For example, if the upper parts consist of C, E, G (the common chord or harmony of C), and, while they are continued, the bass moves from C, the fundamental note of that harmony, to E, another note of the same harmony, that bass is called a *figured bass*.—*Fundamental bass* is that bass which forms the tone or natural foundation of the harmony, and from which that harmony is derived. To explain this by an example: if the harmony consist of the common chord of C, C will be its fundamental bass, because from that note the harmony is deduced; and if, while that harmony is continued, the bass be changed to any other note, it ceases to be fundamental, because it is no longer the note from which that harmony results, and is calculated.—*Ground-bass* is a bass which starts with some subject of its own, and continues to be repeated throughout the movement, while the upper part or parts pursue a separate air, and supply the harmony. This kind of bass was

greatly in fashion half a century ago, but has long since been rejected as an unnatural restraint upon the imagination, and productive of a monotonous melody.—*Thorough-bass*. (See THOROUGH-BASS.)—*Bass clef* is the character put at the beginning of the staff, in which the bass, or lower notes of the composition, are placed, and serving to determine the pitch and names of those notes.—*Basso concertante* (Ital.) is the bass of the little chorus; the bass which accompanies the softer parts of a composition, as well as those which employ the whole power of the band. This part is generally taken by the violoncellos.—*Bass-counter* or *contra-bass*, the under bass; that part which, when there are two basses in a composition, is performed by the double basses, the violoncellos taking the upper bass or *basso concertante*.—*Basso recitante* (Ital.), the bass of the little chorus. (See above.)—*Basso repieno* (Ital.), the bass of the grand chorus; that bass which joins in the full parts of a composition, and, by its depth of tone and energy of stroke, affords a powerful contrast to the lighter and softer passages or movements.

BASS, THE, a remarkable insular trap-rock at the mouth of the Firth of Forth, 3 miles from North Berwick. It is of a circular form, about 1 mile in circumference, rising majestically out of the sea to a height of 420 feet. On being closely approached its aspect is tremendous, from its lofty precipitous walls of rock, and the immense excavations which the sea has opened all around, one of which, running north-west and south-east, may be taken in calm weather. The rock is inaccessible except on one flat shelving point to the south-east. There is a spring of water on its summit, the superficies of which has been gassed at 7 acres, and on which a few sheep are grazed, which bring a high price, Bass mutton being considered a great delicacy. Solan geese and other sea fowl in myriads cover its rocks, and keep flying around it in clouds. On the north-east side the water is of great depth, but shallow on the south. Among the several ruins on the island of historical interest are the remains of a fortalice, commanding the landing-place, capable of accommodating upwards of 100 men, and which had been accessible only by ladders or buckets and chains; and the ruins of a chapel about halfway up the acclivity of the rock. The Bass was purchased by the English government in 1671, and its castle, long since demolished, converted into a state prison, in which several eminent Covenanters were confined. It was the last place in Britain that held out against William III., its gallant defenders, a small band, yielding only when they had no longer means of subsistence. This singular rock anciently belonged to a family of the name of Lauder, the head of which was styled Lauder of the Bass.

BASSA, a district on the West Coast of Africa, forming part of the negro state of Liberia. It came into notice by a grant of land which the American Colonization Society succeeded in obtaining there from the king. The Bassas were then described as without civilization, like so many other negro tribes of this part of the world. See LIBERIA.

BASSANO (whose real name was GIACOMO DA PONTE), a painter, born in 1510. He was surnamed *Bassano* from the place, Bassano, where his father lived. His pictures are scattered all over Europe. He painted historical pieces, landscapes, flowers, &c., and also portraits; among others, that of the Doge of Venice, of Ariosto, Tasso, and other persons of eminence. He lived to the age of eighty-two, dying in 1592. Several of his best works are in the churches of Bassano, Venice, Vicenza, and other towns of Italy. He left four sons, who all became painters. Francesco was the most distinguished of them.

BASSANO, a commercial city in the kingdom of

Italy, province of Vicenza, on the Brenta (lon. 11° 43' E.; lat. 45° 46' N.), has spacious suburbs, and 11,857 inhabitants. Its thirty churches contain beautiful paintings. A stone bridge, 182 ft. long, unites the town with the large village Vicentino. The climate is very favourable to the cultivation of the vine and olive. The trade in silk, cloth, and leather is active, and it has considerable manufactures of straw-hats, porcelain, and wax. Napoleon made Bassano a duchy, with 50,000 francs yearly income, and granted it in 1809 to his minister of foreign affairs, Maret. Near Bassano, September 8, 1796, Bonaparte defeated the Austrian general Wurmser. Bassano was the birth-place of the famous printer Mauritius, as well as the historical painter Giacomo da Ponte (Bassano), and a short distance from Bassano lies the village of Possagno, the birth-place of Canova.

BASSEIN, a town in Lower Burmah, division Irrawaddy, on the left bank of the Bassein river, one of the mouths of the Irrawaddy, with a suburb on the right bank; lat. 16° 46' N.; lon. 94° 48' E. The English fort with the court-houses, treasury, police-office, &c., are on the left bank. In the suburb on the right bank are the rice-mills and store-yards of the principal merchants. The river is navigable up to the town for ships of the largest burden, and Bassein is now a place of considerable trade, exporting large quantities of rice, and importing coal, salt, cottons, &c. Pop. in 1881, 28,147; in 1891, 30,177.

BASSEIN, a decayed town in Hindustan, in the presidency of Bombay, at the south end of a small island of same name, 28 miles north from Bombay, and separated from the island of Salsette by a narrow channel. It was fortified by the Portuguese in 1536, and remained in their possession until captured by the Maharrattas in 1739. During this period it rose to be a fine and wealthy city of over 60,000 inhabitants, with many stately buildings, including a cathedral, five convents, and thirteen churches, and handsome private residences. At the census of 1891 it contained 11,800 inhabitants.

BASSET, the name of a game of cards, formerly much played, especially in France. It is very similar to the modern *farò*. Severe edicts were issued against it by Louis XIV., and it was afterwards played under the name of *pour et contre*. De Moivre, in his *Doctrine of Chances*, has calculated many problems connected with this game.

BASSETTERRE, two towns in the West Indies.—1. Capital of the island of St. Christopher's, a seaport situated at the mouth of a small river, on the south side of the island, and on the edge of the fertile vale of Basseterre, a tract yielding rich crops of sugar and fruits. The town was destroyed by fire in 1807, but has been rebuilt, with better houses and wider streets than before. It has been provided with water by pipes, bringing it from a distance of six miles. It is a place of considerable commercial importance, with a pop. of about 8000.—2. The capital of the island of Guadalupe, lies near the south end of the island, and consists of one principal long street, stretching along the sea-shore. It is defended by Forts Royal and Matilla. The anchorage is unsheltered and exposed to a constant swell. Pop. about 10,500.

BASSET-HORN, the richest of all wind-instruments (called also *cornet*, by reason of its curvature), is believed to have been invented in Passau, in 1770. It was afterwards perfected by Theodora Lotz, in Presburg. It is, properly considered, an enlarged clarinet; and, notwithstanding the difference of its form, it resembles that, not only in its qualities and tone, but also as regards its intonation, the mode of holding it, and fingering; so that every clarinet-

player can perform on it. Besides the mouthpiece it is formed of five pieces—the head-piece, two middle pieces, the trunk, and the bell, the last of which is usually of brass. It differs from the clarinet chiefly in having four additional low keys worked by the thumb of the right hand. Its compass is three and a half octaves, from lower F in the bass to double C of the treble. It is seldom used in the orchestra; however, it is found in Mozart's Requiem and some other pieces. The basset-horn may also be used as a bass instrument.

BASSET-HOUND, or **BASSET**, a short-legged dog formerly much employed in unearthing foxes and badgers. The basset of the present day is a short-legged smooth-haired dog with large pendulous ears and rather large head, resembling that of a blood-hound. It is sometimes used in packs for hunting hares, or may be employed in beating and covert work. There is also a rough-haired basset, called a *basset griffon*.

BASSOMPIERRE, **FRANÇOIS DE**, Marshal of France, one of the most distinguished men of the courts of Henry IV. and Louis XIII., was born in 1579, in Lorraine, and descended from a branch of the house of Cleves. After travelling through Italy he appeared at the court of Henry IV., where his taste for splendour, play, and gallantry soon made him conspicuous. In 1600 he made his first campaign against the Duke of Savoy, and fought with equal distinction in the following year against the Turks. His love of France soon called him back; he aspired to the hand of the daughter of the Constable De Montmorency, whose charms had excited the most violent passion in Henry IV. Bassompierre yielded to the solicitations of his king, and renounced his intended union with her. In 1622 Louis XIII. appointed him Marshal of France, and became so much attached to him, that Luynes, the declared favourite, alarmed at his growing influence, insisted upon his removal from the court. Bassompierre therefore accepted an embassy, and held this position successively in Spain, Switzerland, and England. After his return he entered again into the military service, and was present at the siege of Rochelle and Montauban. The Cardinal Richelieu, who soon after obtained entire control of the king and the country, feared the boldness of Bassompierre and his secret connection with the house of Lorraine; and the machinations of the latter served him as a pretext for sending Bassompierre, in 1631, to the Bastille, from which he was not released till 1643, after the death of the cardinal. He died in 1646. Bassompierre studied, in his youth, philosophy, jurisprudence, medicine, and the military art. During his detention he occupied himself with his memoirs (first published at Cologne, 1665), and the history of his embassies in Spain, Switzerland, and England, which sheds much light on the events of that time.

BASSOON, a wooden reed instrument which forms the natural bass to the oboe, serving as a continuation of its scale downwards. The reed is fixed to a crooked mouthpiece, issuing from the side of the bassoon. The holes are partly closed by the fingers, partly by means of keys. It was formerly used as an accompaniment to the hautboy, but it is now so far improved with keys as to be susceptible of being played solo. Its compass is more than three octaves, from low B flat to A flat in the treble; but its scale is complicated, and much depends upon the player and even upon the individual instrument. It consists of four tubes (besides the mouthpiece), bound together somewhat like a *fagot*. Hence the Italians term it *fagotto*, and from them the Germans *fagott*. It forms, when put together, a continuous tube about eight feet long, but as the bore is bent abruptly back on itself

its height is only about four feet. In music designed for wind-instruments it often forms the bass. It is capable of very fine effects, and has been much employed by some of the best composers, sometimes as a tenor or even alto instrument.

BASSORA, or **BASRAH**, a city in Asiatic Turkey, situated between two and three miles on the w. side of, and on a navigable canal leading from the Shat-el-Arab, as the united stream of the Tigris and Euphrates is called, about half-way between the Persian Gulf and the junction of the two rivers; population in the middle of the eighteenth century, 150,000; in 1824, 60,000; at present only about 20,000. The Shat-el-Arab is navigable for vessels of 500 tons to Bassora, 70 miles. Merchants from Arabia, Turkey, Armenia, and Greece, also Jews and Indians, reside here. The Arabs are more numerous than the Turks, and their language is chiefly spoken. The city is surrounded by a wall about ten miles in circuit, twenty to twenty-five feet thick. The houses are generally mean, partly constructed of clay, and the bazaars are miserable edifices. A considerable trade is carried on. Mail steamers run between Bombay and Bassora, and there are also other steamers trading here. Dates form the principal export; camels and horses, galls, gum, carpets, wool, and wheat are also exported; total exports over £1,000,000 annually. The imports are coffee, rice, spices, textiles, &c. The trade of the interior is conducted by means of caravans. The town is dirty and unhealthy; the environs are very fertile. The modern Bassora arose in the seventeenth century, and does not occupy the site of the older town, whose ruins lie about nine miles south-west of it. The vilayet of Bassora has an area of 16,482 square miles, and a population of about 200,000.

BASSO-RELIEVO. See next art.
BASS-RELIEF, **BAS-RELIEF** (in Italian, *basso-relievo*), that is, low relief, as applied to sculpture, signifies a representation of one or more figures, raised upon a flat surface or back-ground, in such a manner, however, as that no part of them shall be entirely detached from it.—*Alto-relievo*, or high relief, is that in which the figures project half of their apparent circumference from the back-ground.—*Mezzo-relievo*, or middle relief, is a third species, between the two. But, generally speaking, the first term is made to comprehend both the others. The term itself was invented in Italy, about the eleventh or twelfth century, on the revival of the arts; for the Greeks called such works simply carved (*anaglypta*); and to what is now called *high relief* they only applied the term rounded (*torutiké*).

Bass-relief is particularly allied to architecture, and under its dominion, since any considerable work of this kind must be made for the pediment, frieze, or panel of a building, or for some other architectural work, such as a tomb, sarcophagus, pedestal, or column. Bass-reliefs seem to have been invented in the earliest ages by the Egyptians, for the whole of their ancient monuments are covered with them, being executed in the same way as the hieroglyphics on their sepulchral chambers, obelisks, and temples. This has been finely illustrated by the drawings and models of the tomb of Sethi I., originally discovered near the ancient Thebes, by Belzoni, and which has since become familiar to many persons; all the walls of that extraordinary excavation being covered with thousands of figures in low relief, coloured, and exhibiting the religious and warlike ceremonies of that wonderful people. Bass-reliefs, too, are found in India, decorating the subterraneous temples of Ellora and Elephanta in an astonishing profusion. The subjects are, of course, sacred, and in the style of drawing resemble very strongly those of the Egyptian monuments, but are evidently inferior,

having larger heads and disproportioned bodies and limbs. Both these temples have been well illustrated and described by Mr. Thomas Daniell, R.A., and Captain Scally; and for further information, their respective works may be consulted. The Persians, too, like other ancient nations, employed bass-relief as a figured writing, thereby recording and representing the symbols of the power and energy of the Divinity, their own religious ceremonies, and warlike achievements. The sculptures still existing on the ruins of the palace of Persepolis and the royal tombs accord in many striking particulars with those brought to this country by Belzoni. In both the figures are arranged in lines, either horizontal or perpendicular, to suit the double purpose of decoration and description. In both of them the natives of Egypt are distinguished by the hood with pappets, the mitre, the full hair artificially curled, the close tunic, the apron of papyrus; the Hindoos, by the necklaces, bracelets, and anklets; the Hebrews, by their long beards, and hair in spiral ringlets, their caps, full tunics, with regular folds and large sleeves. The Medes, again, by their close tunics; while the Persians themselves, in many particulars, resemble the Hebrews. The comparison may be easily made by looking over the prints in Sir Robert Ker Porter's Travels in Persia, and those in Le Bruyn's Travels, and then the engravings of Denon's and Belzoni's large works.

Since it has been well observed, that the Greeks commenced in works of art precisely where the Egyptians left off, we find that the early bass-reliefs of Greece resemble pretty accurately those of Egypt. The objects are represented in the same hard and simple manner, and the marbles brought to this country from the temple of *Ægina* serve to fill up the history of sculpture, in the interval between its first introduction into Greece and its full development under Phidias, at Athens, when that glorious work, the Parthenon, was produced under the auspices of Pericles.

The draperies in these early bass-reliefs are thin and meagre, showing the forms of the body and limbs, the folds regular, small, and distinct, consisting chiefly of perpendicular and zigzag lines. Some of the head-dresses consist of small curls, very like the fashions of barbarous nations; and in a bronze pattern in the British Museum, the club of Hercules is ornamented with spiral flutes, like one brought by Captain Cook from the Sandwich Islands.

The best examples of bass-relief now in existence are to be found within the walls of the British Museum. We mean, of course, those of the Elgin Marbles, which are executed in this manner. And in the same collection are the tombstone of Xanthippus, and a man curbing a horse, both conjectured to be of the age of Phidias, and which formed part of the Townley collection. In the collection of the Marquis of Lansdowne is a Greek bass-relief of Calchas, the size of life. At Wilton there is a beautiful representation of the Death of Meleager, and a small but curious Hercules and *Æglé*; a bass-relief composed of mosaic in natural colours, which is supposed to be unique. The celebrated Barberini vase, formerly in the possession of the Duke of Portland, is of dark blue glass, bearing figures in bass-relief of white enamel or glass of admirable workmanship. Fragments of bass-reliefs of similar materials have been found in the ruins of Cæsar's palace, at Rome, where they had been fixed in the walls. The two triumphal columns of Trajan and Antonine are covered with bass-reliefs, containing several thousand figures (the first, indeed, has 2500 human figures, according to Vasi), without reckoning horses, elephants, mules, and the implements of war.

Marble sarcophagi do not appear to have been much used in Rome before the time of Crassus, whose wife, *Cedilla Metella*, was buried in one. The fronts and ends of these coffins, from that time for many ages afterwards, were decorated with figures, and some of the finest compositions of the ancient sculptors are to be found upon them, most probably copied from the Greek originals by Roman statuary. The sublimity of the subjects has led to the supposition that some have derived their origin from Phidias, Polyclitus, and others of the greatest masters, as it is scarcely possible such groups and such expressions as we see in these bad copies could have been first imagined by such inferior artists. Among them are the stories of Prometheus, Medea, Phæton, Orestes, Alceste, the Anger of Achilles, Bacchus and Ariadne, the Fall of the Giants, and the Judgment of Paris, &c. Among the famous modern bass-reliefs are those of Bandurli, Ghiberti, and Lucca della Robbia, at Florence. Some of the finest bass-reliefs existing are by Canova, Flaxman, and Thorwaldsen.

BASS'S STRAITS, a channel beset with islands, which separates Australia from Tasmania; 120 miles broad; lon. 147° 30' E.; lat. 40° S.

BASS VIOL, a stringed instrument, resembling, in form, the violin, but much larger. It has four strings and eight stops, which are subdivided into semi-stops, and is played with a bow. See VIOL.

BASTARD The Romans distinguished two kinds of natural children—*nothi*, the issue of concubinage, and *spurii*, the children of prostitutes; the former could inherit from the mother, and were entitled to support from the father; the latter had no claims whatever to support. *Is non habet patrem, cui pater est populus*. The Athenians treated all bastards with extreme rigour. By the laws of Solon, they were denied the rights of citizenship. A law of Pericles ordered the sale of 5000 bastards as slaves. What rendered these regulations more severe was, that not only the issue of concubinage and adultery, but all children whose parents were not both Athenians, were considered bastards at Athens. Thus Themistocles, whose mother was a native of Halicarnassus, was deemed a bastard. The law, as might be expected, was often set aside by the influence of powerful citizens. Pericles himself had it repealed in favour of his son by Aspasia, after he had lost his legitimate children by the plague. The condition of bastards has been different in different periods of modern history. Among the Goths and Franks, they were permitted to inherit from the father. Thierry, the natural son of Clovis, inherited a share of his father's conquests. William the Conqueror, natural son of Robert I., duke of Normandy, and of Arlette, daughter of a furrier of Falaise, inherited his father's dominions. He called himself *Willelmus, cognomento Batardus*. The celebrated Dunois styled himself, in his letters, the *Bastard of Orleans*. In Spain, bastards have always been capable of inheriting. The bastardy of Henry of Transtamare did not prevent his accession to the throne of Castile. In France, the condition of bastards was formerly very different in the different provinces. Since the revolution, it has been regulated in a uniform manner by the general law of the kingdom. The *code civil* thus fixes their rights: If the father or mother leave legitimate descendants, the bastard is entitled to one-third of the portion he would have inherited had he been a lawful child; if the father or mother die without descendants, but leave ascendants, or brothers or sisters, then he is entitled to one-half of such a portion; if the father or mother leave no ascendants nor descendants, nor brothers nor sisters, he is entitled to three-quarters of such a portion; and if the father or mother leave no relations within the degrees of suc-

cession, he is entitled to the whole property. These regulations do not apply to the issue of an incestuous or adulterous connection.

By the common law of England, a child born after marriage, however soon, is legitimate, or at least he is presumed to be so; for one born in wedlock, and long enough after the marriage to admit of the period of gestation, may still be proved illegitimate, in case of absence and non-access of the husband, and under some other circumstances. According to the common law, a bastard is not the heir of any one; and, on the other hand, his only heirs are his children born in wedlock, and their descendants. According to the Roman law, one born out of wedlock might be legitimated by subsequent marriage and acknowledgment of his parents. In 1236 the English prelates proposed the introduction of the Roman law, in this respect, into England, to which the nobility made the celebrated reply, *Nolumus leges Anglice mutare* (We are unwilling to change the laws of England). The Roman law has been long adopted in Scottish law, and in that of some of the United States.

BASTARD BAR, the ordinary name given to the heraldic mark used to indicate illegitimate descent. Properly speaking, it is not a bar at all, which is a band stretching horizontally across the shield, but is correctly a *baton sinister*; that is, it stretches diagonally across the shield in the direction of the sinister chief and the dexter base, but is *couped* or cut short at the ends, so as not to touch the corners of the shield. This circumstance serves to distinguish the bastard bar from the bend sinister, as well as the fact that the former is only one-fourth of the breadth of the latter. When belonging to the illegitimate descendants of royalty, it may be of metal; but in other cases it must be of colour, even when on another colour. This mark in heraldry is of comparatively recent origin, bastards in earlier times not having been allowed to bear the arms of their fathers. It cannot be removed until three generations have borne it, and not even then unless replaced by some other mark assigned by the king of arms, or unless the coat is changed. Sometimes permission was granted to a bastard or one of his descendants to bear it dexter instead of sinister, although he was not allowed to cancel it altogether.

BASTIA, the former capital of the island of Corsica, upon a hill in the north-eastern part of the island, the site resembling an amphitheatre. It is badly built, has narrow streets, a strong citadel near the sea, and a spacious, but not very well sheltered harbour. The inhabitants carry on a considerable trade in manufactured goods, hides, wine, oil, pulse, &c. The stilettoes manufactured here are held in great esteem by the Italians. In 1745 Bastia was taken by the British, but in the following year it was restored to the Genoese. Two years later it was unsuccessfully besieged by the Austrians and Piedmontese; in 1768 it was united with France. It afterwards fell, for a short time, in 1794, into the power of the British. On the new division of the French territories (1791), Bastia was made the capital of the department of Corsica, of which at present Ajaccio is the capital. Bastia is still, however, the commercial and industrial capital of the island. Pop. (1896), 20,357.

BASTILLE properly means any strong castle provided with towers, but as a proper name is applied to a famous castle which once existed in Paris, in which state prisoners and other persons arrested by *lettres de cachet* were confined. It was founded by Hugues d'Aubriot in 1369, and completed by the addition of four towers in 1383. The *lettres de cachet* mentioned above were issued in the name of the king, but the names of the indi-

viduals were inserted by the ministers, who were the depositaries of these letters. Of the origin of this custom we may perhaps find the explanation in Montesquieu's *Esprit des Loix*, where it is said, 'Honour is the virtue of monarchies, and often supplies its place'. A nobleman was unwilling to be dishonoured by a member of his family. Filial disobedience and unworthy conduct were probably not more uncommon among the nobility of France than elsewhere. But in such cases fathers and relations often requested the confinement of the offender, until the head of the family should express a wish for his release. At first this privilege was limited to the chief families of the country. The next step was, that the ministers of government considered themselves entitled to the same privileges as heads of families among the nobility. If an offence was committed in their offices or households, which, if known, would have cast a shadow upon the ministers themselves, they arrested, *motu proprio*, the obnoxious individuals, and often made use of their privilege to put out of sight persons whose honest discharge of duty had excited their displeasure, or who were acquainted with facts disgraceful to the ministers themselves. It sometimes happened that no further examination of the prisoners was held, and the cause of their detention nowhere recorded. In such cases an individual remained in prison sometimes thirty or forty years, or even till his death, because succeeding officers took it for granted that he had been properly confined, or that his imprisonment was required for reasons of state. The invention of the *lettres de cachet* immediately opened the door to the tyranny of ministers and the intrigues of favourites, who supplied themselves with these orders, in order to confine individuals who had become obnoxious to them. These arrests became continually more arbitrary (see *CACHET, LETTRES DE*), and men of the greatest merit were liable to be thrown into prison, whenever they happened to displease a minister, a favourite, or a mistress. On the 14th of July, 1789, the Bastille was surrounded by a tumultuous mob, who first attempted to negotiate with the governor Delaunay, but when these negotiations failed, began to attack the fortress. For several hours the mob continued their siege without being able to effect anything more than an entrance into the outer court of the Bastille; but at last the arrival of some of the Royal Guard with a few pieces of artillery forced the governor to let down the second drawbridge and admit the populace. The governor was seized, but on the way to the *hôtel de ville* he was torn from his captors and put to death. The next day the destruction of the Bastille commenced. A bronze column has been erected on its site. The event considered by itself was of no great national importance, but it marked the beginning of the French revolution.

BASTINADO, a punishment used among the Turks, which consists of blows upon the back or soles of the feet, applied with a light wooden stick, or with a knotted string.

BASTION, a projecting portion of a fortification. In order to defend a place which is surrounded by a rampart and a ditch, it is necessary that every point at the foot of the rampart, in the ditch and before the fortress, should be, as much as possible, commanded by the cannon of the works. This is effected by breaking the line of fortification, so that a defence sideways may be attained. Before, and even after the invention of gunpowder, it was thought that towers, standing out from the wall, would answer this purpose; but these soon gave place to the works called bastions, which consist of two flanks, that serve principally for the defence of the

neighbouring bastions, and of two faces, which command the outworks and the ground before them. The wall between two bastions is called the *curtain*. These bastions are built in very different ways. Some are entirely filled with earth; some have a void space inside; some are straight, some curved, some double, some have even three or four flanks, one over the other; some have *fausse-brayes*, or low ramparts of earth outside; sometimes they have casemates, destined for the retreat of the garrison, or for batteries; sometimes cavaliers (which see) or orillons (which see), &c. In modern times, among the fortifications built according to the system of bastions, those on the plan of Cormontaigne and the modern French works, are considered best adapted for defence. They are spacious; the flank of the side bulwark, which is perpendicular to the prolongation of the face of the principal bulwark, is not farther distant than 300 paces from its point; it is also straight, and orillons and other artificial contrivances are banished.

BASTON, ROBERT, a poet born in the thirteenth century near Nottingham, became prior of a Carmelite convent at Scarborough, and is said to have accompanied Edward II. into Scotland, with the view of celebrating the anticipated victories of his sovereign, but having been taken prisoner, was compelled to change his strain, and wrote in honour of Robert Bruce. He died about 1320, and besides poetry, left several works in Latin, one entitled *De Variis Mundi Statibus*, and another, *De Sacerdotum Luxuria*.

BASTWICK, JOHN, a physician, born at Writtle in Essex in 1583, studied first at Cambridge, and afterwards at Padua, where he took his degree. He settled at Colchester, but instead of confining himself to his profession, entered keenly into theological controversy, and in 1624 procured the publication in Holland of a treatise which he had written, entitled *Menecus Religiosis Papisticæ*, in which, as he declares on the title-page, he proves it to be neither apostolical nor catholic, nay, not even Roman. He afterwards published in London another work with the title *Flagellum Pontificis et Episcoporum Latialium*, which acquired some notoriety as a fervid attack on Episcopacy in general, and attracted the attention of the High-commission Court, who called the author before them, and condemned him to a fine and two years' imprisonment. The sentence produced the result not uncommon in cases of persecution, and Bastwick became more zealous than before, published a defence, addressed to the English judges, and a new "litany," in which his former offences were boldly repeated. A second sentence mercilessly condemned him to a much heavier fine, to exposure on the pillory, the loss of his ears, and imprisonment for life. The last part of the sentence was carried into effect by removing him first to Launceston Castle in Cornwall, and then to the castle of St. Mary, one of the Scilly Isles. The ascendancy of the Parliament in 1640 procured his freedom; the sentence was formally repealed, and Bastwick, with Prynne and Burton, who had been condemned at the same time, made a triumphant entry into London amid the acclamations of the people. The amount of the fines imposed on him was afterwards refunded. He appears to have been a staunch Presbyterian, for in 1648 we find him attacking the Independents. He died in 1654.

BASUTOLAND, a district of South Africa, lying to the east of the Orange River Colony, and on the north-east of Cape Colony. The Basutos belong chiefly to the great stem of the Bechuanas, out of one of the chief branches of whom, along with the survivors of various other Caffre tribes, they have

arisen. Their countenance is better formed than that of the negroes, although they have the flat nose, protruding lips, and woolly hair of the latter. Their figure is slender and well-proportioned, the colour of their skin a very dark brown, and their disposition cheerful, mild, and pacific. Their land, called by themselves *Lesuto*, is very fertile, and is cultivated by them with great industry; but its fertility has long exposed them to the encroachments of their neighbours. Under their chief Moshesh, who died in 1869, they were raised from a state of utter barbarism to a certain degree of civilization, and the land was thrown open to missionaries. Being exposed, however, to constant attacks of their warlike neighbours, Moshesh was at last induced to request the British government to adopt them as subjects. This was acceded to, and in 1868 Basutoland was declared British territory, being annexed to Cape Colony in 1871. In 1884, however, Basutoland was placed under the direct authority of the home government. It has an area of about 10,300 sq. miles, and the exports, which consist chiefly of grain, cattle, and wool, are now estimated at over £100,000 per annum. Pop. in 1891 (Europ.), 578; (native), 218,824.

BAT, an order of mammiferous quadrupeds, characterized by having the tegumentary membrane extended over the bones of the extremities in such a manner as to constitute wings capable of sustaining and conveying them through the air. The name of *Cheiroptera*, or hand-winged, has therefore been bestowed on this order. It comprises a great number of genera, species, and varieties; among which are to be found some most singular modifications of structure, in the form of the wing membranes, the figure and expanse of the ears, and the remarkable membranous appendages to the noses of various species. All the bats are either purely insectivorous, or insect-frugivorous, having exceedingly sharp cutting and acutely tuberculated jaw-teeth, and the whole race is nocturnal. They vary in size from that of the smallest common mouse up to that of the gigantic kalong bat, whose body may measure as much as two feet long. The smaller species are abundantly distributed over the globe; the larger seem to be confined to warm and hot regions, where they exist in great numbers, and are very destructive to the fruits. The purely insectivorous species render great service to mankind by the destruction of vast numbers of insects, which they pursue with great eagerness in the morning and evening twilight. During the daytime they remain suspended by their hooked hinder claws in the lofts of barns, in hollow or thickly-leaved trees, &c. As winter approaches, in cold climates, they seek shelter in caverns, vaults, ruinous and deserted buildings, and similar retreats, where they cling together in large clusters, and remain in a torpid condition until the returning spring recalls them to active exertions. We here observe the admirable arrangement of the great Author of nature, who has rendered it necessary that these animals should be torpid during all the time that their appropriate food is not to be obtained. In warm climates, where a constant succession of insects occurs, the same species of bat, which, in a cold region, would become torpid, continues in activity throughout the year.

Bats enjoy the senses of sight and hearing to a considerable degree of perfection, but the acuteness of their sense of touch is perhaps unequalled throughout the whole extent of animal organization. In consequence of the great expansion of integument forming the exceedingly delicate membrane of the wings, ears, and nasal appendages, bats are able, even when deprived of their eyes, to fly in such a manner as to avoid every obstacle. Silk threads,

small cords, or other obstructions placed across the course of a bat that has been purposely blinded, are avoided with surprising dexterity. The reaction of the air against the membranes is sufficient to warn them of any obstacle, however slight, and enables them to turn, lower themselves, or draw in their wings, so as to avoid the body, without the least appearance of effort. These velvet-like wings enable them to fly without noise, and, though their motion is unsteady and wavering, they advance with exceeding swiftness. From a flat surface it is very difficult for them to rise into the air. As above stated they suspend themselves by the hooks on their hind feet, and readily take wing by relinquishing their hold. The hook at the extremity and anterior edge of the fore-arm corresponds in situation to the human thumb, and is also used for prehensile purposes.

Bats generally bring forth two young, and suckle them until old enough to provide for themselves. The parent shows a strong degree of attachment for her offspring, and, when they are captured, will follow them, and even submit to captivity herself, rather than forsake her charge. Bats bite with much force, and the older and larger can inflict a very severe injury. With the exception of the Greater Horseshoe Bat (*Rhinolophus ferrum-equinum*), and the Lesser Horseshoe Bat (*R. hipposiderus*), all the British bats are comprised in the family Vespertilionidae. The first two are characterized by having a nose leaf in two portions, the lower part shaped like a horseshoe, and they also have large ears, without an inner ear or tragus. Both are rare in Britain. The Vespertilionidae have no nose-leaf, are possessed of a tragus, and have long tails. The common English bat (*Vesperugo pipistrellus*), the Pipistrelle, is the smallest of the British species. The Noctule (*V. noctula*), or great bat, a tree haunting species, has broad rounded ears set far apart. The Serotine (*V. serotinus*) is found in the south of England, and, unlike the noctule, is solitary. *V. leiseri*, the Hairy-armed Bat, closely resembles the noctule, but is smaller. Daubenton's Bat (*Vesperugo Daubentoni*) has large feet, and frequents the neighbourhood of water. Another species of this genus (*V. Nattereri*), Natterer's Bat, is of local occurrence; its colour is lighter than that of any other British bat. Bechstein's Bat (*V. Bechsteini*) is also light coloured, but it is rarer than Natterer's. The Whiskered bat (*V. mystacinus*) resembles Natterer's bat in structure, but in habits it is like the pipistrelle. The Long-eared Bat (*Plecotus auritus*) has a rudimentary nose-leaf; and the Barbastelle (*Symotis barbastellus*) is a rare species in Britain, distinguished from the long-eared bat by its shorter ears and solitary habits. See CHEIROPTERA, PIPISTRELLE, KALONG, VAMPIRE BAT, &c.

BATALHA, a village in Portugal, 69 miles north of Lisbon, with a Dominican convent, founded by King John I., in commemoration of a victory over the King of Castile in the year 1385. This convent is one of the most splendid buildings in Europe. It is in the Norman Gothic style, 576 feet long and 443 wide. The church, in which lie the remains of the founder and the following three kings of the house of Aviz, as well as those of Prince Henry the Navigator, is a beautiful edifice, adorned with many art-treasures.

BATANGAS, a town of the Philippines, in the island Luzon, 68 miles S. of Manila. It was founded in 1581, and is situated on the large bay of Batangas, opening into the Strait of Mindoro. It is well-built, containing several spacious streets, in which are many elegant mansions. The most important public edifice is the residence of the alcalde. The trade, carried on chiefly with the capital, Manila, consists for

the most part of various articles of native produce. Pop. (1898), 39,368.

BATAVIA. See SWEET POTATO.

BATAVIA, a city and seaport of Java, on the north coast of the island, near the west end, and the capital of all the Dutch East Indies; lon. 106° 50' E.; lat. 6° 8' S. It is situated on a wide, deep bay, in which are interspersed many low, green islets, within which ships find safe anchorage, the roadstead being sheltered from the north-west monsoon. The largest of these islets is Onrust, at which all ships above 300 tons burden have to anchor. The town consists of two portions. The old is situated in a low, marshy plain near the sea, and is intersected by the Great River and sundry canals. The miasmata, generated in the putrid mud-banks and canals, render this part of the town exceedingly unhealthy, and subject to an intermittent fever, very fatal to strangers. Much has been done, however, to diminish the unhealthiness by draining the marshes, and letting currents of water into the stagnant canals. In consequence of the removal of the Europeans to the suburbs, many houses of the old town present a very dilapidated appearance; still it is the business part of the town, and contains the principal warehouses and offices of the Europeans, the Java Bank, and the exchange. The most important of the suburbs is Weltevreden, which is built on a plain lying above Batavia, at some distance from the coast, and now contains barracks for the soldiers, the governor-general's palace, and the government buildings. The suburbs have more the appearance of a garden than a town, each house being built apart and surrounded by cocoa-nut trees, bananas, &c. On the west side of the Great River is the Chinese quarter, inhabited entirely by Chinese. The public edifices are neither numerous nor splendid. The principal are the stadthouse, a Calvinistic, a Lutheran, and a Portuguese church, several Mohammedan mosques, and some Chinese temples. There are also some charitable institutions. Batavia is the chief mart among the islands of the Asiatic Archipelago for the products of the Eastern seas and the manufactures of the West, and its commerce is correspondingly important. Batavia was founded by the Dutch in 1619, taken by the British in 1811, but restored to the Dutch in 1816. It attained its greatest prosperity in the beginning of the 18th century, when it had about 150,000 inhabitants. The population in 1896 amounted to 115,600. The inhabitants are chiefly of Malay extraction, with a considerable admixture of Chinese, and a small number of Europeans (Dutch, English, and Portuguese). See JAVA.

BATAVIAN REPUBLIC, the name adopted by the Seven United Provinces of the Netherlands soon after the French revolution, and acknowledged by the powers of Europe. The whole republic was declared one and indivisible; all members of society were declared equal in the eye of the law, without respect to rank or birth; all religious societies, acknowledging a Supreme Being, equally protected by law. Feudality was abolished, all fiefs declared allodial, and possessors of lordships to be indemnified. In 1806 the form of government was changed into that of a kingdom, under the name of *Holland*; and the Batavian republic fell nominally under the sway of Louis Bonaparte as its sovereign, but really under that of his brother Napoleon. See BELGIUM and NETHERLANDS.

BATAVIANS, an old German nation which inhabited a part of the present Holland, especially the island called *Batavia*, formed by that branch of the Rhine which empties itself into the sea near Leyden, together with the Waal and the Meuse. Their territories, however, extended much beyond the Waal. Tacitus commends their bravery. According to him,

they were originally the same as the *Catti*, a German tribe which had emigrated from their country on account of domestic troubles. This must have happened before the time of Caesar. When Germanicus was about to invade Germany from the sea, he made their island the rendezvous of his fleet. Being subjected by the Romans, they served them with such courage and fidelity as to obtain the title of their friends and brethren. They were exempted from tributes and taxes, and permitted to choose their leaders among themselves. Their cavalry was particularly excellent. During the reign of Vespasian they revolted, under the command of Civilis, from the Romans, and extorted from them favourable terms of peace. Trajan and Adrian subjected them again. At the end of the third century the Salian Franks obtained possession of the island of Batavia. After the constitution of the United provinces was changed by the French in 1798, they formed the Batavian Republic, until Louis Bonaparte became King of Holland (1806).

BATH, a city in Somersetshire, 12 miles E. Bristol, 67 S.W. Oxford, 107 W. London; lon. 2° 22' W.; lat. 51° 28' N. It is beautifully situated on the Avon, in a narrow valley bounded on the N.E. and S.W. by hills, and widening on the N.W. into rich and extensive meadows. The Avon is navigable from Bath to Bristol. Bath is remarkable for its medicinal waters, for its various sources of amusement, for the elegance of its streets, and the magnificence of its public buildings. The houses are of superior construction, built of freestone, obtained from the hills about the town. The Abbey Church, a cruciform structure which was begun in the year 1499, ranks as one of the finest specimens of perpendicular Gothic architecture. The church of St. Michael has a handsome tower, and a pierced spire, which is one of the most striking features of the place. There is a handsome Roman Catholic church. Among educational institutions are the grammar-school, a Wesleyan college, Bath College (proprietary), a school for the daughters of military officers, &c. Besides the general hospital for the reception of invalids who desire the benefit of the waters, there are several other hospitals and charitable institutions, technical schools, mechanics' institute, &c. The Grand Pump-room Hotel and baths is an elegant building. The springs, four in number, yield no less than 184,320 gallons of water a day; and the baths are both elegant and commodious. The temperature of the springs varies from 109° to 117° Fahrenheit. They contain carbonic acid, chloride of sodium and of magnesium, sulphate of soda, carbonate and sulphate of lime, &c. They are found of great efficacy in cases of gout, rheumatism, indigestion, palsy, and biliary obstructions.

Bath was founded by the Romans, and called by them *Aqua Solis* (Waters of the Sun). Amongst the Roman remains discovered here were some fine baths, found about 20 feet below the present level of the soil. The largest of these has been again laid bare and will remain permanently open. The city owed much of its early celebrity and prosperity to the personage known by the name of Beau Nash, who came to reside there in 1704, and who, from the zeal and tact he displayed in arranging and conducting the balls, assemblies, and other amusements of the town, was unanimously voted master of the ceremonies—a position which he occupied undisputed for about half a century. Nash died in 1761, and was buried with great pomp in the Abbey Church. Anstey, the author of the New Bath Guide, in which the follies and vices of that fashionable resort are so cleverly satirized, was a native of this city. Jointly with Wells, it is the head of a diocese, and returns

two members to the House of Commons. The pop. of Bath in 1891 was: co. bor. 51,844; par. bor. 54,551; in 1901, co. bor. 49,817; par. bor. 52,751. It is often considerably increased by visitors.

BATH, a town, United States, Maine, on the west side of the Kennebec, 12 miles from the sea, and 36 north-east of Portland; population in 1890, 8728. Bath is pleasantly situated, and has great advantages for commerce, being at the head of winter navigation. The river here is seldom frozen over. It is one of the most commercial towns in Maine, and is largely engaged in ship-building. It has a number of excellent schools, including a high-school. One or two of the churches are handsome edifices.

BATH, BATHING. The use of the bath is primarily for purposes of cleanliness, but it also subserves various other useful ends. Bathing undoubtedly took place first in rivers and in the sea, but men soon learned to enjoy this pleasure in their own houses. Even Homer mentions the use of the bath as an old custom. When Ulysses enters the palace of Circe, a bath is prepared for him, after which he is anointed with costly perfumes, and dressed in rich garments. In later times, rooms, both public and private, were built expressly for the purpose of bathing. The public baths of the Greeks were mostly connected with the gymnasias, because a bath was taken immediately after the athletic exercises. The Romans imitated the Greeks in this matter, and built magnificent baths in which both males and females could bathe (in separate divisions), and warm or cold baths could be taken; such establishments, indeed, were so extensive that even their ruins excite admiration.

The Cold Bath.—The first effect of the cold bath (at a temperature say from 50° to 70°) is to produce a shock on the nerves of the skin. As a result the vessels of the skin become strongly contracted, the blood is driven out of them and seeks the deeper parts, which also will be suddenly excited by the rush of blood to them. Proof of this is found in the increased rate of the heart's beat and the quickening of the breathing. The temperature of the skin is reduced, but not that of the body as a whole, unless the immersion be prolonged. In the case of the cold bath as ordinarily used, the application is short, and the more near to the temperature of 50° Fahr. the water is the shorter it must be. Following the first action is reaction, during which the blood returns to the skin, the blood-vessels of which relax, and a pleasant sensation of 'glow,' spreading rapidly over the surface, is experienced. This reaction is aided by rapid friction of the skin, as by towels, and if, after drying, the body is quickly clothed and exercise engaged in, the total effect of the bath is stimulating, inducing a feeling not only of warmth but also of vigour. The length of time the cold may be applied without interfering with the setting in of a proper reaction depends upon the individual. A mere instant's immersion is sufficient for some, others can bear several minutes, while some could not bear complete immersion of the body at all, a feeling of coldness and shivering lasting for hours after it. Obviously for such persons the full cold bath is not suitable, and the cold wet towel, cold wet sponge, wet sheet, &c., may be used instead, and may gradually lead up to the full cold plunge, which may thus be made tolerable and enjoyable. The cold bath is not suitable for the old and the delicate. The action of the cold water may be intensified by showering it or spraying it on the body by means of various arrangements of pipes, &c. The morning or early part of the day is the suitable time for all such kinds of baths. Persons who are thus habituated to the use of cold water are less susceptible to the

influence of cold and can stand longer exposure than others.

Tepid Baths (temperature 85° to 95°) produce neither depression nor excitement, and are therefore suited for all. They are the best when prolonged immersion is desired, as in the treatment of chronic skin and nervous diseases.

The Warm Bath (temperature 96° to 104°) is particularly serviceable in removing feelings of fatigue. It should quicken only slightly the circulation, and bring an additional quantity of blood to the skin. It is by this means that it removes the tired feeling from exhausted muscles, for it promotes the removal from the tissues of the waste products, which have accumulated during the period of activity, and whose presence in the muscles is the cause of the feeling of weariness. After prolonged labour, or a long fatiguing walk, or prolonged exposure to damp and cold, or after, for example, the exertion of much dancing, nothing is so restorative and refreshing as a warm bath. When employed for such purposes, the person should end with a spray or douche, or simple sponge of tepid water (70°) if he is about to go to bed, or with a warm spray, quickly reduced to cold, before dressing to go out. Warm baths are largely employed in feverish affections of children, for promoting the action of the skin; and they are a safe resort in the convulsions of children, cold being at the same time applied to the head.

The Hot Bath (temperature 102° to 110°) acts in a more pronounced way upon the heart and nervous system than the merely warm bath. If very hot it powerfully excites the heart, whose action, indeed, it may stimulate to violence. The brain is also influenced by the more copious flow of blood through it, due to the vigorous action of the heart. These effects, however, are largely counterbalanced by the increased flow of blood to the skin. But the prolonged use of hot baths is weakening, and the temporary strain thrown upon the heart and blood-vessels and brain would be hurtful to many. The bather should be immersed to the chin; the hair is damped with cold water, and a thin cold cloth is wrapped about the head. Cold water may be drunk if desired. The bath should last twenty minutes, or less if oppression is felt. It should conclude, as directed for warm bath, with tepid douche or sponging, or with warm spray quickly reduced to cold. The hot bath should not be used in the morning or early part of the day, or at any time except before going to bed, unless the person is properly cooled down before dressing and going out.

The Hot-air Bath is one of the most powerful ways of stimulating the activity of the skin. The person, unclothed, is placed in an apartment heated by means of furnaces, the air being dry. In a longer or shorter time, according to the heat of the air and the condition of the bather, the perspiration bursts out upon the skin, becoming very copious, so that the whole body is bathed in sweat. A very high temperature may be borne so long as the air is quite dry, for the sweat passes rapidly off from the body in the form of vapour, removing a large quantity of heat, and thus the temperature of the body does not rise, unless the air is very hot, when the heat of the body usually increases by two or three degrees. The same high temperature could not be borne if the air were moist, as in the case of a vapour bath, for then the air is saturated or nearly so with moisture and cannot take up more, or can take up very little. Marked oppression, difficulty of breathing, fulness in the head, faintness, &c., would then speedily arise. When the air is quite dry, however, a high temperature, for example, that of 180° Fahr., can usually be endured with ease, and even above 212°. Not only

the activity of the skin, but the action of the heart and of breathing are greatly increased. It is thus not suited for everyone, certainly not in its full form for anyone with weak heart or vessels, and for very full-blooded persons.

The Turkish Bath.—The hot-air bath is usually obtained with other accessories in the form of the Turkish bath. This bath was adopted by the Turks from the Romans, who derived it from the Greeks. The ordinary method is well known, and the general arrangements need be but briefly mentioned. The bather enters the dressing-room (*Roman vestiarius*) which is heated to an ordinarily comfortable temperature. Beyond this room there are, in the fully-equipped Turkish baths, three rooms, separated from the dressing-room by well-padded doors. The first of these corresponds to the Roman *tepidarium*, the warm room, in which the temperature is from 115° to 120°; beyond this and separated from it by heavy curtains is the hot room, or *calidarium*, in which the temperature ranges from 120° to 140°; and still beyond is the hottest room, called also the flue room, corresponding to the Roman *lacunicum*. Here the temperature is not below 150°, usually 175° to 180°, but may be 200° and upwards. Every Turkish bath has at least two rooms beyond the dressing-room, one in which the temperature may readily be raised to 140° or thereby, and one beyond it in which the highest temperatures may be obtained. A most important point in the construction of a Turkish bath is the arrangement for ventilation, means being provided by which the moist and polluted air may be removed and replaced by perfectly dry and pure hot air. When a full Turkish bath is taken the following is the usual course:—The bather undresses in one of the curtained recesses of the dressing-room, girds a towel or similar cloth round his loins, and carrying a bath-towel over the arm passes into the warm room. Here he stays only long enough to wet the hair with cold water, and perhaps drink of it, and then passes on, straight through the hot room, into the hottest room. Spreading his towel over a chair he reclines upon it, wets his head with cold water, and drinks at his pleasure, but not too copiously, of cold water, which the attendant will bring him. Here he remains five or ten minutes. By this time the whole body will be bedewed with perspiration; and the bather passes out into the room next in temperature, the hot room, where he reclines for another ten or fifteen minutes. Then he passes to the warm room, lower in temperature than the former, and here he reclines till the attendant is ready for him, when he proceeds to the washing room. Here he lies on a table and the attendant goes over the whole body, rubbing the surface, and thus removing all loose effete skin, grasping and kneading muscles, bending joints and so on. He is then rubbed over with soap, scrubbed and washed down, and lastly doused with warm and then tepid and cold water. From this room the bather passes out quickly, plunges through a cold bath, and regains the dressing-room, where he is quickly dried down with warm dry towels. He is then enveloped in a dry bath-towel, and so attired he lies down on his couch in the dressing-room, covered over with a light rug or blanket, till his skin assumes its natural degree of warmth. When the skin is cool and dry, usually in fifteen or twenty minutes, the bather dresses quietly and deliberately, and may then go out; only he must take care to be sufficiently cooled, yet not so much as to feel chilly. The ordinary duration of the full bath, from the flue room to the washing room, is from forty minutes to an hour. The full bath, however, is suited chiefly for those accustomed to it, and for the healthy and robust. For those unaccustomed to it, a briefer

form of bath is preferable as a preparation, for the first one or two occasions, and may be the only advisable form for those not quite robust.

The *Vapour Bath* acts upon the body much as the hot-water bath does, but it acts more powerfully, though the effect of the heat is not so quick since vapour is a slower conductor of heat than water. This bath can, therefore, be borne hotter than a water bath, but the high temperature cannot be borne long, for the vapour does not permit of the loss of heat from the body as hot air does. The temperature of the vapour bath cannot be comfortably endured above 120° Fahr. The vapour bath is characteristic of the Russian baths. It is taken in a chamber filled with vapour, which is thus not only applied to the surface of the body but also inhaled. This makes it still more oppressive. It may be used, however, in a simple form, in which the vapour is not breathed, by the person sitting on a chair, surrounded from the neck downwards by blankets, which envelop the chair also and hang to the ground. Under the chair is placed a shallow earthenware or metal dish, containing boiling water to the depth of 3 or 4 inches. Into the water are placed a couple of red-hot bricks. Or under the chair may be placed a spirit-lamp, supported above it being a shallow pan containing boiling water. Such baths are very useful for catarrh, for rheumatic and neuralgic pains, sciatica, &c., as well as for cases where excessive action of the skin is desired to relieve deeper organs, for example the kidneys. Ten to fifteen minutes are long enough for exposure in the vapour bath.

Sea-bathing.—Ordinary sea-bathing is of course cold, and produces the stimulating effects described in regard to the cold bath. There is besides the additional stimulus due to the salt, so that sea-bathing acts as an invigorating tonic. It is not, however, suited for everyone, and is taken much too indiscriminately. It is also indulged in without due precaution. It is a very common error for persons to remain in the sea too long, the result being shivering, blueness of the skin, difficulty in recovering warmth, headache, &c. Persons who are anæmic—that is, of deficient quality of blood—ought not to indulge in sea-bathing without advice, and failing advice had better try first a salt-water bath at home. Persons who have suffered from any internal complaint ought also to refrain. The best time for sea-bathing is in the morning. It should never be indulged in immediately after a meal, when the business of digestion is going actively forward. A good time is before lunch or early dinner, for which the brisk walk home after the bath will prove an excellent appetizer. Neither should sea-bathing be engaged in immediately after very active exercise, when the body is in a state of very active perspiration or in a condition of fatigue. At the same time, moderate exercise before the bath is unobjectionable, and the body ought to be comfortably warm. The person should undress quickly and plunge in bodily, wetting the whole body at once. During the bath exercise should be active, as in continued swimming. Children, because of the little-resisting power of their young bodies, are very readily depressed by sea-bathing, and are not to be subjected to it as a matter of course. By bathing at home, by wading, which they usually enjoy, they may be gradually accustomed to it; but they ought not to be forcibly immersed to their aversion and terror. Sea-baths may be imitated at home by the addition of common salt or sea salt to water. The benefits of open-air bathing—sea or river—are not limited, of course, to the action of the water, but are increased by the action of the fresh air, the respiration of which is stimulated by the bath, and by the active exercise in the open air invariably indulged in afterwards.

There are many kinds of *medicated baths*, which have, or are supposed to have special properties, valuable for diseased conditions, because of containing various saline substances dissolved in them. Such baths may be artificially prepared by the addition of the salts to the water, or natural mineral waters may be used for the purpose. *Mud-baths* are another species recommended for special reasons.

Various arrangements are employed for accentuating the effect of the water, whether used hot or cold, or for applying it to particular parts of the body. The *Spray bath* is one well-known variety of bath. The *Douche* is a jet of water directed upon some part of the body through a 1½-inch pipe, the force of the water, quantity discharged, and temperature being capable of modification. It at first lowers the vitality of the part to which it is applied, but reaction sets in quickly, so that its whole effect is stimulating, quickening tissue change. The *douche* may be used hot or cold, or one after the other in rapid succession, a change which is most stimulating of all. In old-standing complaints, thickenings about joints, for stiff joints, &c., it is a very useful application. In the case of the descending *douche*, the pipe is 10 to 15 feet above the floor level, and for the horizontal *douche* the pipe is 4 feet above floor level. In the former case it is played first on the spine, and then shoulders, hips, arms and legs in succession. At the close it is directed on to the chest and head, the force of the water being broken by the hands. In the latter case the back, chest, arms, and legs are doused in the order named, while the patient rubs himself vigorously. Before beginning the head is wetted with cold water, and is doused last, the force of the water being broken. The process should last from one to two minutes.

The *Sitz-bath* or *Hip-bath* is a means of limiting the application of the water to the hips and neighbouring parts. The form of the bathing-tub is such that the person has the bath in the sitting posture, the limbs and upper part of the body being out of the bath. The *sitz-bath*, hot or cold according to circumstances, is in much use for abdominal and liver complaints, and specially for feminine ailments. Its soothing effects, when used hot, in painful and spasmodic disorders of bowels, bladder, and womb, are very marked.

Altogether the use of the bath, in association with treatment by medicines, is of the highest value in numerous disorders, rheumatic, gouty, digestive, febrile, &c. In particular, the Turkish bath, under due superintendence, may produce surprising results, from checking a simple cold upwards.

BATH, KNIGHTS OF THE, an order of England, concerning the origin of which antiquaries differ. It is certain that Henry IV., on the day of his coronation, conferred the degree upon forty-six knights. From that time the kings of England have bestowed this dignity previous to coronations, after births and marriages of the royal issue, &c. Charles II. created several Knights of the Bath, but after his time the order fell into neglect, till 1725, when George I. revived it. By the book of statutes then prepared, the number of knights was fixed at thirty-eight, viz. the sovereign, and thirty-seven knights companions. The king allowed the chapel of Henry VII., in Westminster Abbey, to be the chapel of the order. The limits of the order were greatly extended by the prince regent in 1815, to reward the distinguished services of officers during the wars; and again in 1847, when it was also opened to civilians. It was further enlarged in 1861. It now consists of three classes, each of which is subdivided into (1) military members, (2) civil members, and (3) honorary members, consisting of foreign princes and officers.

The first class consists of Knights Grand Cross (G.C.B.); the second of Knights Commanders (K.C.B.); and the third, of Companions (C.B.). The dean of Westminster is dean of the order. The ribbon of the order is crimson, and its motto, 'Tristis in uno.'

BATHGATE, a town and police burgh of Scotland, in Linlithgowshire, 18 miles w. of Edinburgh. It comprises an old and a new quarter; the latter with straight and spacious streets. It has a handsome parish church (rebuilt 1882), United Free Churches, &c.; corn exchange, working-men's institute, and a well-known academy occupying a handsome structure. There are here a distillery, a grain mill, and in the vicinity paraffin works (Young's), coal and ironstone mines. Pop. in 1881, 4885, in 1891, 5330, in 1901, 6786.

BATHORI, or **BATTORI**, a celebrated Hungarian family, which in the fifteenth century became divided into two branches, one of which gave Transylvania five princes, and Poland one of its greatest kings—1. **STEPHEN**, born in 1532, originally in private life, entered the army, and by his valour and prudence had so distinguished himself that when the death of John Sigismund Zapolya, nephew of Sigismund II., king of Poland, in 1571, had left a vacancy in the sovereignty of Transylvania, Stephen Bathori, without courting the honour, was unanimously elected. When the throne of Poland became vacant by Henry of Valois quitting the country in order to mount the throne of France, Stephen Bathori was elected to succeed him in 1575, and was crowned along with his queen, Anne, daughter of Sigismund Augustus, at Cracow, in 1576. He found the kingdom torn asunder by faction, the people enervated by long peace, the treasury exhausted, and the army without discipline. He therefore gave his first attention to internal improvement, but had no sooner effected it than he determined to recover the Polish territories of which the Czar of Muscovy had managed to possess himself by fomenting dissensions. He accordingly declared war against him, beat him at all points, and compelled him to accept a disadvantageous peace. Under Stephen Bathori, Poland enjoyed a comparative tranquillity to which it had long been a stranger, and he was meditating important constitutional reforms, which promised to make that tranquillity permanent, when he died suddenly at Grodno, in 1586—2. **SIGISMUND**, nephew of Stephen, became warlike or prince of Transylvania in 1581, shook off the Ottoman yoke, and, by the great talents he displayed, had begun to give hopes of reigning gloriously as an independent sovereign, when, from mere thick-skinnedness and eccentricity of character, he voluntarily resigned his dominions to the emperor Rudolph II., in return for two principalities in Silesia, a cardinal's hat, and a pension. With the same thick-skinnedness, however, he immediately repented of the act, and availing himself of an invitation by the Transylvanians, returned, and placed himself under the protection of the Porte. The talent which he had displayed, and the good fortune which had followed him in early life, appeared now to have forsaken him. The Imperialists defeated him in every battle, and he was obliged to throw himself on the mercy of the emperor, who sent him to live at Prague, where he died almost forgotten in 1613.

BATHOS, a Greek word meaning depth, now used to signify a ludicrous sinking from the sublime to the mean in poetry. This application of the word was introduced by Swift, who, in his *Art of Sinking in Poetry*, opposes the *bathos* to the *sublime*.

BATH-STONE, one of the three kinds of oolitic limestone, which is extensively used in building, and is so called from being found in the neighbourhood

of Bath. This member of the oolite formation has been called the great oolite, and it is of considerable thickness. When it is just quarried it is soft, but it soon becomes hard on exposure to the atmosphere. It is, however, not very durable, and buildings for which it is used, after no very long time begin to crumble away.

BATHURST, a town on the west coast of Africa, on the island of St. Mary's, near the mouth of the Gambia, capital of the British colony Gambia. The market is thronged by individuals of different tribes, and abundantly supplied with beef, mutton, poultry, fish, milk, and butter. The trade is chiefly in gum, bees'-wax, ground-nuts, hides, ivory, and gold, bartered for British cloths and cutlery. Pop. 6000.

BATHURST, the principal town in the western district of the Australian colony of New South Wales, on the south bank of the Macquarie river, 2153 feet above sea-level, and surrounded by hills; it is 144 miles (by rail) west from Sydney. It has wide, well-laid-out streets crossing each other at right angles, with a central square planted with trees. The public buildings include the Anglican and Roman Catholic cathedrals, and churches for the Baptists, Congregationalists, Wesleyans, Presbyterians, and others; the court house, jail, and town-hall; the post and telegraph offices; an hospital, numerous schools, a school of arts, &c. There are several tanneries, a coach factory, railway workshops, breweries, and flour-mills. Soap, candles, glue, boots and shoes, and furniture are also extensively manufactured. Pop. (1881), 2221; (1891), 9069.

BATHYBIUS (Gr. *bathys*, deep, and *bios*, life), the name given by Huxley to the masses of animal matter said to be found covering the sea-bottom at great depths; and in such abundance as to form in some places deposits of 30 feet or more in thickness. It consists of a tenacious, viscid, slimy substance, exhibiting under the microscope a network of granular, mucilaginous matter, which expands and contracts spontaneously, and thus forms an organism of the utmost simplicity corresponding in every respect to protoplasm (which see). Embedded in this substance are found peculiar calcareous bodies, with an organic structure (*diacoliths*, *coccoliths*, and *coccospheres*), which seem to belong to the *Bathybius* as such. Some men of science, however, doubt the existence of such a substance, maintaining that the apparent signs of an organic life in the matter which Huxley examined were due to the alcohol in which the matter was preserved. On the other hand the North-polar navigator Bessels subsequently reported the discovery in Smith Sound, at the depth of 92 fathoms, of a free undifferentiated homogeneous protoplasm, to which he has given the name of *Protophabybius*.

BATIGNOLLES-MONCEAUX, a commune on the N.E., and properly a suburb of Paris. In 1814 it was an open unoccupied space, which the Prussians, under Blücher, used as their camp. It is now covered with handsome buildings, and has a pop. of 44,000.

BATLEY, a municipal and parliamentary borough of England, in the West Riding of York, 8 miles south of Leeds, and just north of Dewsbury, with which it is united for parliamentary purposes. The houses are chiefly of stone, and rather irregularly built. Batley has an ancient parish church in the early English style, a town-hall, a grammar and a technical school, mechanics' institute, &c. The principal manufactures are heavy woollen cloths, Batley being the chief seat of the manufacture of heavy woollens, in which trade there are over fifty mills and factories engaged in the town and vicinity. There are also iron foundries, machine-works, collieries, &c. Pop. in 1891, 28,719; in 1901, 30,321.



1. Ringed Siphonops 2. Tree Frog 3. Common Frog 4. Skeleton of Frog 5. Egg-carrying Frog 6. Fire bellied F
- Salamander. 13. Newt. 14. Giant Salamander. 15. Axolotl-larval

OTHER AMPHIBIA.



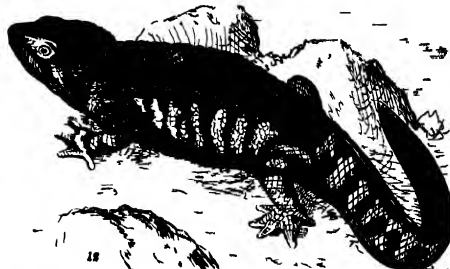
16



14



10



13



11



14

1	2	3	4	5	6	7	8	9	10	11	12
				Horned Frog	Pipe or Shrike Toad	Spotted Salamander	Spectacled Salamander	Walter's Salamander			
				perfect animal	Amphiuma	Proteus	Siren				

BATONI, POMPEO GIROLAMO, an Italian painter, the last who is of importance in the history of Italian painting, was born at Lucca in 1708; died at Rome in 1787. The manner in which he executed his paintings was peculiar. He covered his sketch with a cloth, and began to paint the upper part on the left hand, and proceeded gradually towards the right, never uncovering a new place before the first was entirely finished. Boni, who compares him with Mengs, calls the latter the *painter of philosophy*; the former, the *painter of nature*. Batoni painted many altar-pieces, and numerous portraits; for instance, that of the emperor Joseph and the empress Maria Theresa, in the imperial gallery. His greatest work is his Fall of Simon the Sorcerer, which was ordered by Cardinal Albani, for the church of St. Peter's at Rome, and was intended to be executed in mosaic, at that time regarded as the highest honour. His Magdalene, in Dresden, and his Return of the Prodigal Son, in Vienna, are also celebrated.

BATON ROUGE, a town in the United States of America, cap. of Louisiana, on the left bank of the Mississippi, 129 miles n. w. New Orleans. It stands on a high bluff commanding a fine view of the river and surrounding country, and has a handsome state-house, a college, an arsenal, barracks, and penitentiary. In 1862 the possession of it was contested between the Federal and Confederate forces, and in Aug. 5 of that year, the Confederates under General Breckenridge suffered a severe defeat before it. Pop (1880), 7197; (1890), 10,478.

BATRACHIANS, according to the system of Cuvier, an order of reptiles, of which the frog, called in Greek *batrachos*, may be considered as the type; but modern naturalists have separated the Batrachia from the reptiles proper, and the term is now employed either as synonymous with Amphibia, the Amphibia being regarded as forming a separate class of the vertebrata; or the term Batrachia is applied (as by Huxley) in a narrower sense to an order of this class, including the frogs and toads, or the tail-less amphibians. Hence the name Anoura is sometimes given to this order, from *an*, the Greek negative prefix, and *oura*, the Greek word for a 'tail.' The Amphibia, or Batrachia in the wider sense, are so far from being really allied to the Reptilia that by Huxley they have been arranged along with the fishes to form the group Ichthyopsida, one of the three primary sections into which he divides all vertebrata, while he puts the reptiles in the class Sauropsida along with the birds. One marked distinction between the batrachians and the reptiles is, that the former have invariably gills at some period of their life while the latter have not. The chief characters of the batrachians in the narrower sense, that is the frogs and toads and perhaps the extinct labyrinthodon, are as follows. In the larval stage the animals have both gills and a tail, the young living in the water like fish, but these organs are absent in the adult stage, in which two pairs of limbs are present, the respiration then being purely aerial and carried on by means of lungs; the skin is soft and devoid of scales; the dorsal vertebrae are procoelous (that is, concave in front); no ribs proper are present, but only long transverse processes which serve instead; teeth are sometimes wanting altogether, but generally the upper jaw at least is furnished with small teeth; the hind limbs are generally longer and more powerful than the fore limbs and are usually webbed for swimming; the radius and ulna in the fore limb, and the tibia and fibula in the hind limb are ankyloused into one bone; the apical column is short (consisting of ten vertebrae in the frogs); the tongue is soft and fleshy. The common frog and toad are the batrachians best known in this country,

and the development of the former, from the familiar 'tadpole' stage to the perfect animal, is a most interesting and instructive study. The Anoura are usually divided into three sections Ranidae, the frogs, Bufonidae, the toads, and Pipidae, the Surinam toads. (See FROG, TOAD, HTRA.) A number of these forms are shown in our plate. Fig. 4 exhibits the skeleton of a frog, *a* being the scapula, *b* the united tibia and fibula, *c* the femur, *d* the tarsus, *e* the carpus, *f* the united radius and ulna.

BATRACHOMYOMACHIA (Gr.; *batrachos*, a frog; *mys*, a mouse; and *machē*, a battle), the battle of the frogs and the mice—a mock-heroic poem, in which a war between the frogs and the mice is described with much humour, falsely ascribed to Homer, and, apparently the *Iliad* travestied, probably composed by an Alexandrian.

BATTA, a country in the north of Sumatra, which stretches between Sinkell and Tabuyong, on the west side of the island, and the Bila and the Rakan on the east side. The whole pop. is estimated at about 300,000. The soil is fertile, and produces chiefly camphor, gum, benzoin, cassia, cotton, and indigo. The language of the Battas is a settled one, and extensively written. They have many neatly printed books.—There is another Batta, a province in Africa, formerly an independent state, now subject to Congo. Principal towns, Batta and Cangon.

BATTA, an allowance which military officers in India receive in addition to their pay. It was originally given only when the officers were under march or in the field, and not in cantonments, and was intended to enable them to provide for the additional expenditure to which, in the former case, they were necessarily subjected. It afterwards was paid under all circumstances, but now half batta only is paid when troops are in cantonments.

BATTALION, the tactical unit of command in infantry, whereas the regiment is an administrative unit. In the British Army (according to recent arrangements), each regiment should consist of two battalions of troops of the line, two militia battalions, and the affiliated volunteers belonging to the regimental district; but this as yet has not been fully carried out. The battalion again is made up of companies, and the companies are further subdivided into sections. The English battalions at home have normally a strength of 800 rank and file; but their complement of men is not absolutely fixed; and in the Crimea in 1855, the battalions consisted of 2000 rank and file, divided into twelve service companies, four reserve, and four depot companies. The number of men in the Prussian battalions on the war footing is 1000, divided into four companies. The Austrian battalion is rather stronger, and is divided into six companies; the French battalion is also divided into six companies.

BATTERING-RAM. The ancients employed two different machines of this kind—the one suspended, and vibrating about the manner of a pendulum, and the other movable on rollers. The swinging ram resembled in magnitude and form the mast of a large vessel, suspended horizontally at its centre of gravity, by chains or cords, from a movable frame. Ligatures of waxed cord surrounded the beam at short intervals, and cords at the extremity, opposite to the head, served for the purpose of applying human force to give the oscillatory motion. Other cords, at intermediate distances, were also sometimes employed. The rolling ram was much the same as the above in its general construction, except that instead of a pendulous motion, it received only a motion of simple alternation, produced by the strength of men applied to cords passing over pulleys. This construction seems to have been first employed

at the siege of Byzantium. These machines were often extremely ponderous. Appian declares that, at the siege of Carthage, he saw two rams so colossal that 100 men were employed in working each. Vitruvius affirms that the beam was often from 100 to 120 feet in length; and Justus Lipsius describes some as 180 feet long, and 2 feet 4 inches in diameter, with an iron head weighing at least a ton and a half. In contrasting the effects of the battering-ram with those of the modern artillery, we must not judge of them merely by the measure of their respective momenta. Such a ram as one of those described by Lipsius would weigh more than 45,000 lbs., and its momentum, supposing its velocity be about 2 yards per second, would be nearly quadruple the momentum of a 40-lb. ball moving with a velocity of 1600 feet per second. But the operation of the two upon a wall would be very different. The ball would probably penetrate the opposing substance, and pursue its way for some distance; but the efficacy of the ram would depend almost entirely upon duly apportioning its intervals of oscillation. At first it would produce no obvious effect upon the wall; but the judicious repetition of its blows would, in a short time, give motion to the wall itself. First, there would be a just perceptible tremor, then more extensive vibrations; these being evident, the assailants would adjust the oscillations of the ram to that of the wall, till at length a large portion of it, partaking of the vibratory impulse, would, by a well-timed blow, fall to the earth at once. This recorded effect of the ram has nothing analogous in the results of modern artillery.

BATTERSEA, a portion of London, in Surrey, forming with Clapham a parliamentary borough, on the right bank of the Thames, across which there is communication by several bridges. There is a fine public park in Battersea, extending over 185 acres, and containing a considerable sheet of water. There is a Church of England training college for schoolmasters and a Wesleyan for schoolmistresses. Clapham and Wandsworth Commons are fine areas of unenclosed ground. Battersea and Clapham send two members to Parliament—one for each division. Battersea parish is a borough under the London Government Act (1899). Pop. (1901) of mun. bor., 168,896; of par. bor., 102,450.

BATTERY, in the military art, any work in which one or more cannon are planted, and which may be permanent or temporary. Batteries are erected in the open field, before a place which is to be besieged, on a coast, &c. With regard to the kind of artillery, they are distinguished into cannon, howitzer, mortar, &c. With regard to their object, they may be divided into breach batteries, used to attack the faces or salient angles of the bastion or ravelin, in order to make an accessible breach; batteries *en écharpe*, or oblique batteries, which are erected beside the breach batteries, under an angle of 20–30 degrees, in order to batter a breach obliquely; *ricochet* batteries, which command the enemy's lines, so that the balls roll along the whole length of the rampart, and render it insecure, &c. Their position is perpendicular to the line which is to be enfiladed. In respect to their construction they may be divided into elevated, sunken, half-sunken, &c. An elevated battery has the platform for the guns on the level of the ground; a sunken battery is excavated in the ground so that the guns can range just along its surface; a half-sunken battery has an excavation both in the interior and exterior to furnish earth for the parapet. Floating batteries are also well known, the most celebrated probably being those that were invented by d'Arçon, and used in 1782 against Gibraltar. (See **FLOATING**

BATTERIES.) During the Crimean War armoured floating batteries moved by steam-power were used on the suggestion of Napoleon III.

A battery, or in this sense more properly a field-battery, also signifies a number of pieces of artillery, varying from four to eight, which are for tactical purposes under the command of one person. The term includes also the ammunition wagons, the stores, horses, men, and whatever else is necessary for the service of the guns. In the British and most other armies a field-battery consists of six pieces. In the British service *mountain batteries* are well known. These are intended to be employed in mountainous regions, and mules, ponies, or elephants have been employed with them.

In experimental physics, *battery* is a combination of several jars or metallic plates, to increase the effect of electricity and galvanism. (See **LEYDEN-PHIAL** and **GALVANISM**.)

BATTERY, in law. See **ASSAULT**.

BATTEUX, CHARLES, French scholar, honorary canon of Rheims, born in 1713 at Aliand'huy, a village near Rheims. He displayed his gratitude to this city, in which he received his education, by the ode *In Civitatem Remensem*, 1739, which was much admired. In 1750 he was invited to Paris, where he taught rhetoric in the colleges of Lisieux and Navarre. He was afterwards appointed professor of Latin and Greek philosophy at the Royal College. In 1754 he became a member of the Academy of Inscriptions, and in 1761 of the French Academy. He died July 14, 1780. Batteux left a large number of valuable works. He did much service to literature and the fine arts, by introducing unity and system into the numerous canons of taste, which had gained a standing among the French by the example of many eminent men, particularly in regard to poetry, and must be regarded as a valuable writer on aesthetics, notwithstanding the higher point of view from which this science is now considered. Some of his most valuable works are *Les Beaux-Arts réduits à un même Principe*, Paris, 1747; and *Cours de Belles-Lettres ou Principes de la Littérature*, Paris, 1774. These works were translated into several other languages.

BATTHYANYI, COUNT LOUIS, a distinguished Hungarian patriot, was born at Pressburg in 1809, and entered the army as a cadet at the age of sixteen. On coming into possession of a large fortune on attaining his majority, he abandoned a military for a diplomatic career, and in process of time attained the rank of leader of the opposition in the Hungarian diet. Upon the breaking out of the commotions of 1848, Batthyanyi took an active part in promoting the national cause, and with a company of armed vassals came forward to assist it in the field. On the entry of Windischgrätz into Pesth in January, 1849, he was arrested in the home of his sister-in-law, the Countess Karolyi. After being conveyed to various places he was finally brought back to Pesth, tried by court-martial, and condemned to be hanged. The execution of this sentence he prevented by inflicting several wounds with a poniard on his neck, and he was accordingly shot on the evening of 6th October.

BATTLE, a market-town and parish, England, county of Sussex. The town, in a valley nearly encircled by wooded hills, 7 miles s.w. of Hastings, consists chiefly of one irregular street, in which there are many old-fashioned buildings, is well supplied with water, and lighted with gas. The church is ancient, and contains some fine specimens of painted glass and numerous antique monuments. There are places of worship also for Wesleyans, Baptists, Roman Catholics, and Congregationalists, and en-

dowed schools. Battle was long celebrated for the manufacture of gunpowder. The original name of this place was Senlac, and it received its present name from the battle of Hastings which was fought here. In memory of the battle William the Conqueror erected a great abbey, the ruins of which have a circumference of about a mile. This building has almost entirely disappeared, but interesting remains of a subsequent building exist, including the gateway, a beautiful specimen of the decorated English style. One portion of this building now forms a mansion. Pop. in 1891, 3153; in 1901, 2996.

BATTLE. The object of a war may be obtained in two different ways: either one party forces the enemy, by skillful manoeuvres, marches, demonstrations, the occupation of advantageous positions, &c., to quit the field (which belongs to the province of *strategy*); or the hostile masses approach each other, so that a battle becomes necessary to determine which shall keep the field. Troops may either meet by design or by chance. When they meet by chance, and are thus obliged to fight, it is called a *rencontre*. The rules for ensuring a successful issue, whether they respect the preparations for the conflict, or the direction of the forces when actually engaged, belong to *tactics*, in the narrower sense of the word. *Strategy* also shows the causes which bring armies together, and produce battles without any agreement between the parties. It may be sufficient to say, in general, that armies in their marches (and consequently in their meeting) are chiefly determined by the course of the mountains and rivers of a country. In ancient times and the middle ages the battle-ground was often chosen by agreement, and then the battle was a mere trial of strength, a sort of duel; but, in our time, such trifling is done away with. War is now carried on for the real or pretended interest of a nation, or a ruler who thinks or pretends that his interest is that of the nation. Wars are not undertaken for the purpose of fighting, and battles are merely the consequence of pursuing the purpose of the war. They arise from one party's striving to prevent the other from gaining his object. Every means, therefore, of winning the battle is resorted to, and an agreement can hardly be thought of. In this respect a land battle is entirely different from a naval battle. The former is intended merely to remove an obstacle in the way of gaining the object of the war; the destruction of the enemy, therefore, is not the first thing sought for. But the object of a naval engagement is, almost always, the destruction of the enemy; those cases only excepted, in which a fleet intends to bring supplies or reinforcements to a blockaded port, and is obliged to fight to accomplish its purpose.

As the armies of the ancients were not so well organized as those of the moderns, and the combatants fought very little at a distance, after the battle had begun manoeuvres were much more difficult, and troops, when actually engaged, were almost entirely beyond the control of the general. With them, therefore, the battle depended almost wholly upon the previous arrangements, and the valour of the troops. Not so in modern times. The finest combinations, the most ingenious manoeuvres, are rendered possible by the better organization of the armies, which thus, generally at least, remain under the control of the general. The battle of the ancients was the rude beginning of an art now much developed. It is the skill of the general, rather than the courage of the soldier, that now determines the event of a battle.

Battles are distinguished into *offensive* and *defensive*. Of course, a battle which is offensive for one side is defensive for the other. Taciticians divide a

battle into three periods—that of the disposition, that of the combat, and the decisive moment. The general examines the strength, recognises the position, and endeavours to learn the intention of the enemy. If the enemy conceals his plan and position, skirmishes and partial assaults are often advisable, in order to disturb him, to obtain a view of his movements, to induce him to advance, or with the view of making prisoners, who may be questioned, &c. Since the general cannot direct all these operations in person, officers of the staff assist him; single scouts or small bodies are sent out, and spies are employed. Every means is made use of for obtaining information regarding the enemy, or the ground on which the battle is likely to take place. According to the knowledge thus acquired, and the state of the troops, the plan of the battle, or the disposition, is made; and here military genius has an opportunity to display itself. To the disposition also belongs the detaching of large bodies which are to co-operate in the battle, but not under the immediate command of the chief. The plan of the battle itself, the position of the troops, &c., is called the *order of battle* (*ordre de bataille*). This is either the parallel, or the inclosing (if the enemy cannot develop his forces, or you are strong enough to outflank him), or the oblique. (See **ATTACK**.) When each division of troops has taken its position, and received its orders, and the weaker points have been fortified (if time allows it), the artillery placed on the most favourable points, all chasms connected by bridges, villages, woods, &c., taken possession of, and all impediments removed as far as possible (which very often cannot be done, except by fighting), then comes the second period—that of the engagement. The combat begins, either on several points at a given signal, as is the case when the armies are very large, and a general attack is intended, as, for instance, at Leipzig, where three fire-balls gave the signal for battle on the side of the allies; or by skirmishes of the light troops, which is the most common case. The artillery endeavours to dismount the batteries of the enemy, to destroy his columns, and, in general, to break a passage, if possible, for the other troops. The forces, at the present day, are brought into action mostly in open order, and not, as formerly, in long but weak lines. Here the skill of the commanders of battalions is exerted. Upon them rests the principal execution of the actual combat. The plans and orders of a general reach only to a certain point; the chiefs of battalions must do the great work of the battle. Before the battle, the general places himself upon a point from which he can see the conflict, and where he can easily receive reports. A few men are near him as his body-guard; others take charge of the plans and maps; telescopes are indispensable. He often sends one of his aides to take command of the nearest body of cavalry, in order to execute a new movement quickly. He receives the reports of the generals under him; disposes of the troops not yet in action; strengthens weak points; throws his force on the enemy where he sees them waver; or changes, if necessary, with a bold and ingenious thought, the whole order of battle. The general now uses every means to bring on the third period of the battle—the decisive moment.

In the Austro-German campaign of 1866, and the still more important Franco-German campaign of 1870, great changes were developed both in strategy and tactics. The changes in strategy were due chiefly to the ease with which the general could direct detached bodies of troops over a wide area by means of the telegraph, and the facility with which troops, provisions, and ammunition could be moved from point to point by railway. The changes in tactics, again,

arose chiefly from the longer range and quicker firing capacity of modern rifles, and the greater importance attached to the massed firing of long-range breech-loading artillery.

BATTLE (or **BATTEL**), WAGER OF, an obsolete method of deciding cases, whether civil or criminal, by personal combat between the parties or their champions in presence of the court. A woman, a priest, a peer, or a person physically incapable of fighting could refuse such a trial. See **APPEAL**, **CHAMPION**, and **COMBAT**.

BATTLE-AXE, a weapon much used in the early part of the middle ages, particularly by those who fought on foot. It was not uncommon, however, among the knights, who used also the mace, a species of iron club or hammer. Both are to be seen in the different collections of old arms in Europe. The Greeks and Romans did not employ the battle-axe, though it was found among contemporary nations. In fact, the axe is one of the earliest weapons, its use as an instrument of domestic industry naturally suggesting its application for purposes of offence; but, at the same time, it has always been abandoned as soon as the art of fencing, attacking, and guarding was cultivated; because the heavier the blow given with this instrument, the more will it expose the fighter. It never would have remained so long in use in the middle ages, had it not been for the iron armour, which protected the body from everything but heavy blows. In England, Ireland, and Scotland, the battle-axe was much employed. At the battle of Bannockburn, King Robert Bruce gave an English champion down to the chin with one blow of his axe. The Lochaber-axe remained a formidable weapon in the hands of the Highlanders to a recent period, and was used by the old city guard of Edinburgh.

BATTLEFORD, the chief town of the Saskatchewan district of the North-West Territories of Canada, on the river Battle near its junction with the North Saskatchewan, about 100 miles w. by s. of Prince Albert. Pop. 2000.

BATTLE-PIECE, a painting which represents a battle, exhibiting large masses of men in action. The armour of the ancients, and the whole array and action of their battles, afford subjects much more favourable to the artist than the straight lines or condensed columns and the firearms of the moderns. A painter of battle-pieces ought to have an accurate knowledge of the appearance of horses and men, and, if possible, to have seen a battle, as few persons are able to form from hearsay an accurate idea of such a scene. Some of the greatest pieces of this kind are the Battle of Constantine, of which the cartoons were drawn by Raphael, and which was executed by Giulio Romano; Lebrun's Battles of Alexander; and the Battles of the Amazons, by Rubens.

BATTUE, a method of killing game by having persons to beat a wood, copse, or other cover, and so drive the animals having their haunts there, especially pheasants, hares, or rabbits, towards the spot where the sportsmen are stationed to shoot them. It is practised chiefly where game is strictly preserved.

BATUECÁS, LAS, two valleys, inclosed by high mountains, in the Spanish province of Salamanca, so inaccessible, that the inhabitants are said to have been unknown to the Spaniards for several centuries. However, a convent of Carmelites was built in the Batuecas valleys as early as 1599. They are situated so low that, in the longest days, the sun only shines there for four hours.

BATUM, or **BATOU**, a Russian town in Caucasia, on the east shore of the Black Sea, about 160 miles west of Tiflis. It has a sheltered and fairly spacious harbour, and is connected by rail with the chief

towns of Transcaucasia. A considerable trade is carried on; and in spite of the fact that the Berlin Congress of 1878 declared it a free port, the Russians have converted it into a naval station. Pop. (1897), 26,417.

BAUCIS, in fabulous history a Phrygian woman, the wife of Philemon. They received Jupiter and Mercury hospitably, after these gods had been denied hospitality in the whole country while travelling in disguise. A deluge destroyed the remainder of the people, but Philemon and Baucis, with their cottage, were saved. They begged the gods to make their cottage a temple, in which they could officiate as priest and priestess, and that they might die together; which was granted. Philemon and Baucis are, therefore, names often used to indicate faithful and attached married people.

BAUDELAIRE, CHARLES PIERRE, a French poet, born at Paris on April 9th, 1821. In early life he resided for some time in the East Indies, and on his return devoted himself to literature. He first gained some reputation by translations from the works of Edgar Allan Poe, four volumes of which appeared in 1856-65, regarded as master-pieces in their way. A production, however, that caused greater noise, was a collection of poems designated *Les Fleurs du Mal* (1857), which had to be expurgated as the result of proceedings on the part of the police authorities. This work gave Baudelaire a high position as a writer of the romantic school, and evidenced at the same time his curious inclination for repulsive subjects. A work of higher tone was his *Petits Poèmes en Prose*; others being *Les Paradis Artificiels*, *Opium et Haschich*; a monograph on Théophile Gautier; and R. Wagner at Tannhäuser à Paris. He died on 30th August, 1887.

BAUHIN.—1. JOHN, an eminent botanist, born at Basel in 1541, studied medicine under his father, who long stood at the head of his profession there, after his Protestantism had driven him from France. He distinguished himself by his ardour in natural history pursuits, in prosecuting which he travelled over the greater part of the Alps, Italy, and the south of France, preparing materials for a *Historia Plantarum*, which occupied the larger portion of his life, but was not published till 1650, thirty-seven years after his death. This work, in which he describes 5000 plants, divided into forty classes or books, is in three vols. folio, and is considered the first in which an attempt was made to give a regular form to systematic botany.—2. GASPARD, brother of the foregoing, born at Basel in the year 1560, was at first intended for the Protestant ministry, but having, like his brother, manifested a decided inclination for medicine and botany, was allowed to follow it, and studied first at Basel and then at Padua. After finishing his studies he travelled over many parts of Europe, and in 1580 returned to Basel, bringing with him a reputation which immediately secured him the chair of Greek, and afterwards (in 1589) that of anatomy and botany. His fame rests chiefly on his two works, *Pinax Theatri Botanici* and *Theatrum Botanicum*. He died in 1624. The Bauhins have been happily commemorated by Linnaeus, by giving the name of *Bauhinia* to a genus belonging to the natural order Leguminosae, tribe Cæsalpinieae, and remarkable for having its leaves generally divided into two twin lobes. The species are mostly climbing plants found in tropical regions, and in some the flowers are large and beautiful.

BAUHINIA. See preceding article.

BAUMANN'S CAVERN (in Ger. *Baumanni Höhle*), an interesting natural cavern in the Harz, in the principality of Blankenburg, on the left bank of the Bode, about five miles from Blankenburg, in a

limestone mountain, consisting of six principal apartments, besides many smaller ones, everywhere covered with stalactites. The earthy ingredients of these petrifications are held in solution by the water which penetrates the rock, and deposits a calcareous stone. The name of this cavern is derived from a miner, who entered it in 1672, with the view of finding ore, but lost his way, and wandered about for two days before he could find the entrance.

BAUME, ANTOINE, a distinguished chemist and pharmacist, born at Senlis in 1728, obtained the professorship of chemistry in the College of Pharmacy at Paris about 1762, was admitted a member of the Academy of Sciences, chiefly in return for some excellent memorials communicated to that body; wrote Elements of Theoretical and Practical Pharmacy, which went through nine editions in France, and was translated into most European languages, and contributed by his discoveries to numerous important improvements in the arts, particularly in the manufactures of sal-ammoniac, soap, and porcelain, in gilding, and the bleaching of silk. He died in 1804. His name is familiar from the areometer which he invented, and which is still in use.

BAUMGARTEN, ALEXANDER GOTTLIEB, an acute and clear thinker of the school of Wolf, was born in 1714 at Berlin, studied at Halle, and was, for a time, professor extraordinary there. In 1740 he was made professor of philosophy at Frankfort-on-the-Oder, and died there in 1782. He is the founder of aesthetics as a science, and the inventor of this name. He derived the rules of art from the works of art and their effects. Hereby he distinguished himself advantageously from the theorists of his time. (See *ÆSTHETICS*.) His ideas of this science he first developed in his academical discussion, *De Nonnullis ad Poema pertinentibus* (Halle, 1735, 4to). George Fr. Meier's Principles of all Liberal Sciences (three vols., Halle, 1748-50) originated from his suggestions. Eight years later, Baumgarten published his *Æsthetics* (Frankfort-on-the-Oder, 1750-58, two vols.), a work which death prevented him from completing.

BAUR, FERDINAND CHRISTIAN, one of the most celebrated theologians of modern Germany, founder of the 'New Tübingen School of Theology,' was born at Blaubeuren, where his father was pastor, on the 21st of June, 1792. At the University of Tübingen, which he entered in 1809, he devoted five years to theological studies, and in 1817 he became professor in the seminary at Blaubeuren. While holding this position he published his first work, *Symbolik und Mythologie, oder die Naturreligion des Alterthums* (Symbolism and Mythology, or the Natural Religion of Antiquity: Stuttg. 1824-25), by which his eminent theological abilities were so clearly manifested that in 1826 he received a call to Tübingen as ordinary professor in the evangelical faculty of that university. This position he continued to occupy till his death, on the 2d of December, 1860. His chief works belong to the two departments of the history of the Christian dogmas and New Testament criticism, in both of which his views have had the most powerful effect upon the theology of the present day.

His most important works belonging to the first class are:—*Die christl. Gnosis, oder die christl. Religionsphilosophie* (The Christian Gnosis, or the Christian Philosophy of Religion; Tüb. 1835); *Die christl. Lehre von der Versöhnung* (The Christian Doctrine of the Atonement; Tüb. 1838); *Die christl. Lehre von der Dreieinigkeit und Menschwerdung Gottes* (The Christian Doctrine of the Trinity and the Incarnation; Tüb. 1841-3); *Lehrbuch der christl. Dogmengeschichte* (Compendium of the History of Christian Dogmas; Stuttg. 1847). To the second class

belong *Die sog. Pastoralbriefe des Apostels Paulus* (The so-called Pastoral Epistles of the Apostle Paul, Stuttg. 1835); *Paulus, der Apostel Jesu Christi, Sein Leben und Wirken, seine Briefe und seine Lehre* (Paul the Apostle of Jesus Christ, his Life and Labours, his Epistles and his Teaching; Stuttg. 1845); *Kritische Untersuchungen über die Kanonischen Evangelien, &c.* (Critical Inquiries concerning the Canonic Gospels, their Relation to One Another, their Origin and Character; Tüb. 1847). He has also written the History of Christian Doctrine from the Origin of Christianity down to the End of the Eighteenth century, which was published in a series of volumes between 1858 and 1863, the last two posthumously.—This Baur is to be distinguished from Gustav A. L. Baur, a German theologian of the school of Schleiermacher, born in 1816, died in 1889; and Bruno Bauer, a biblical critic and philosopher, born in 1809, died in 1882.

BAUSE, JOHANN FRIEDRICH, a distinguished German engraver, born at Halle in 1738, died at Weimar, 1814. He resided chiefly at Leipzig, where he executed many highly esteemed engravings. He was a member of several academies of fine arts.

BAUTZEN, or **BUDISSIN**, capital of the circle of the same name (pop. in Dec. 1800, 405,092), in the kingdom of Saxony, upon a height defended on the west side by steep rocks, the foot of which is watered by the Spree. Among the 26,025 inhabitants, who are principally Lutherans, there are a great number of Wends, or descendants of the Vandals, who worship in a Lutheran and in a Catholic church, in their own language. The German part of the population, both Catholic and Protestant, worship together in the cathedral: the former are in possession of the third part of it, including the high altar, sufficiently large for the small Catholic congregation; the nave serves the Lutheran community as their parish church, and the mutual spirit of toleration in both parties has, in recent times, prevented trouble from such an arrangement. Bautzen has fine barracks, a gymnasium, a seminary for the training of teachers, manufactures of woollen, fustian, cloth, leather, paper, and machines, and considerable trade in flax, yarn, and wool. It is an old town, and was fortified by Otho I. It contains the castle of Ortenburg, which was formerly the frequent residence of the Bohemian kings. It was taken during the Seven Years' War by the Prussians in 1757, and here also Napoleon defeated the united armies of the Russians and the Prussians on the 21st of May, 1813.

BAVARIA [German, *Baiern*; French, *Bavière*] a kingdom of Central Europe, in the south of Germany, composed of two isolated portions of unequal size. The larger portion, comprising about seven eighths of the monarchy, is included between lat. 47° 19' and 50° 41' N., and lon. 8° 53' and 13° 50' E. bounded east by Bohemia and the arch-duchy of Austria, south by Tyrol, Vorarlberg, and Lake Constance, west by Württemberg, Baden, the grand-duchy of Hesse, and the Prussian province of Hesse-Nassau north by the states of Ducal Saxony, the principalities of Reuss, and the kingdom of Saxony. The smaller portion, the Pfalz or Palatinate, lies west from the main portion of the kingdom, and separates from it by Württemberg, Baden, and the grand-duchy of Hesse. It is included between lat. 48° 57' and 49° 50' N.; and lon. 7° 6' and 8° 31' E.; and is bounded east by the Rhine, which separates it from Baden south by the German territory of Alsace-Lorraine west by the Prussian Rhine provinces and a portion of Saxe-Coburg, and north by the grand-duchy of Hesse. Bavaria has an area of about 29,300 square miles, and is divided into eight governmental districts (*Regierungsbezirke*), which were formerly named

after the rivers that watered them; but in 1837 the districts received new names and new boundaries.

The following table shows the new and old names of the districts, with their area and population:—

DISTRICTS.		Area, sq. m.	Pop. 1900	Chief Towns	Pop. 1900.
<i>Modern Name.</i>	<i>Ancient Name.</i>				
1. Oberbairien (Upper Bavaria).	Isarkreis (Isar)	6,458	1,223,447	Munich	499,033
2. Niederbairien (Lower Bavaria).	Unterdonaukreis (Lower Danube)	4,133	674,584	Landshut	21,736
3. Pfalz (Palatinate).	Rheinkreis (Rhine)	2,298	831,533	Speyer	20,911
4. Oberpfalz (Upper Palatinate) and Regensburg (Ratisbon).	Regenkreis (Regen)	3,845	553,857	Ratisbon	45,426
5. Oberfranken (Upper Franconia)	Obermainkreis (Upper Main)	2,702	607,903	Bairreuth	29,894
6. Mittelfranken (Middle Franconia)	Reiztskreis (Reizut)	2,122	815,556	Nürnberg	261,922
7. Unterfranken (Lower Franconia) and Aschaffenburg.	Untermainkreis (Lower Main)	3,243	650,758	Würzburg	75,497
8. Schwaben (Swabia) and Neuburg	Oberdonaukreis (Upper Danube)	3,787	713,516	Augsburg	80,109
Total.		29,375	6,175,153		

Mountains.—Bavaria is a hilly rather than a mountainous country. A large portion, more especially south of the Danube, is a plateau country of considerable elevation, and indeed, the whole of the main portion of the kingdom may be described as an upland valley, averaging about 1600 feet above the sea-level, intersected by numerous large streams and ridges of low hills. On all sides it is surrounded by hills of a greater or less altitude, either quite upon the frontier or only at small distances from it. The whole south frontier is formed by a branch of the Noric Alps, offsets from which project far into the south plateau of Bavaria. Besides numerous peaks which this range contains, varying from 4000 to 8000 feet high, the following may be named as being above the latter number:—the Zugspitze, 10,394 feet high; the Watzmann, 9470 feet; the Hochvogel, 8480 feet; the Madeler Gabel, 8650 feet. Passing along the valley of the Inn and across the Danube, we come to the Bohemian frontier, formed by the Bohmerwald Mountains running s.e. to n.w., and lowering down at the valley of the Eger. The highest peaks in this range are the Rachel, 5102 feet, and the Arber, 5185 feet. Crossing the Eger we meet with the Fichtelgebirge, presenting the Schneeburg, 7350 feet high, and the Ochsenkopf, 8633 feet. West from this range, and along the frontier of the Saxon ducal territories and Hesse-Cassel, run hills of moderate elevation, under various names, Frankenwald, Rhongebirge, &c., no peaks of which attain an elevation of more than 3327 feet. The west mountain boundary of the Bavarian valley is formed north of the Main by the Spessartwald range, and in the kingdom of Wurtemberg by the Alb or Alp. The only noteworthy interior ranges are, in the n.w., the Steigerwald; and in the n.e., running in a s.w. direction from the Fichtelgebirge, the Franconian Jura; a low limestone range, containing numerous remarkable stalactitic caves. The Pfalz or Palatinate is traversed by the north extremity of the Vosges, the highest peak in this locality being the Königstuhl, 2162 feet high.

Lakes.—The lakes of Bavaria are neither very numerous nor of very great extent, though many of them present exceedingly picturesque scenery. The larger are all situated on the upper part of the south plateau; the smaller within the range of the Noric Alps. The most remarkable of the former are, Lake Ammer, about 10 miles long by 2½ broad, 1736 feet above the sea; Lake Wurm or Starnberg, about 12 miles long by 3 broad; 1899 feet; and Lake Chiem, 9 miles long by 9 to 4 broad, 1651 feet above the sea. Of the smaller, the more remarkable are Lake Tegern, about 3 miles long, 2586 feet; Lake Walchen, 2597; and various others upwards of 2000 feet above the sea-level. Most of the lakes are well supplied with fish.

Rivers.—Bavaria belongs wholly to the basins of the Danube and the Rhine, with exception of a very small portion in the n.e. corner, which through the Eger appertains to the basin of the Elbe. The river Danube intersects the main portion of the kingdom west to east nearly in the centre, and before it enters the Austrian dominions at Passau, where it is still 925 feet above the sea, it receives on its right bank the rivers Iller, Lech, and Isar, which have their sources in the Noric Alps, besides numerous smaller streams; and on its left bank, the Wörnitz, Altmühl, Nah, and Regen, besides other lesser streams. The Main traverses nearly the whole of the north part of this portion of the kingdom from east to west, and is navigable for steam-vessels from Bamberg to the Rhine. Its principal affluents are the Regnitz and the Saale. In the Palatinate there are no streams of any importance, the Rhine being merely a boundary river.

Climate.—If we except the valley of the Rhine, and the valley of the Main in Lower Franconia, Bavaria, even including the Palatinate, in comparison with other German states, is a cold country. The average temperature of the year is about 47° Fahrenheit, the same as the east coast of Scotland. Winter, 30°; spring, 47°; summer, 63°; and autumn, 47°.

Soil and Vegetation, &c.—Bavaria is one of the most favoured countries in Germany, in respect of the fruitfulness of its soil, due no doubt in a considerable degree to the undulating nature of the country, to the numerous streams by which it is watered, and to being nearly wholly composed of Jura limestone. In the plains and valleys the soil is capable of producing all kinds of crops, but not until lately were the natural advantages of the country turned to good account. Ignorance and idleness opposed a barrier to improvement, which it took the utmost efforts of an enlightened government, aided by the general spread of education, to remove. At length a spirit of agricultural enterprise pervades the kingdom, improved methods of cultivation have been introduced, and large tracts of waste land have been reclaimed and brought under the plough. The principal crops are wheat, rye, barley, and oats; but in some districts rice, spelt, maize, and buckwheat are also raised. To these productions of the soil may be added potatoes (the cultivation of which is yearly increasing), tobacco, and fruit, of which large quantities are grown in the valleys of the Main and the Rhine. In the circles of Mittelfranken and Schwaben-Neuburg, the hop plant is cultivated to a considerable extent, the quantity varying from 80,000 to 40,000 cwts. per annum; and the vine in the circles of Pfalz and Unterfranken. The latter produces the Franconian wines; the best wines of the former are produced near Deidesheim and Wachenheim.

The celebrated Steinwein and Leistenwein are the produce of the south slope of the Marienberg, near the town of Würzburg. The forests of Bavaria, composed chiefly of fir and pine trees, cover nearly a third of its entire surface, and yield a large revenue to the state; much timber being annually exported, together with potashes, tar, turpentine, and other products peculiar to these wooded regions.—The principal mineral products are salt, coal, and iron. Some of the mining works belong to the state, and contribute something to the public revenue; but the minerals are not wrought to the extent they might be. Coal-mining gives employment to between 4500 and 5000 hands. Black-lead is found in several places, and pretty largely manufactured into pencils. Porcelain clay of the finest quality likewise abounds in some localities, the best being obtained in the district of Wunsiedel in the Upper Main. Lithographic stones should also be mentioned.—In the rearing of cattle and sheep the Bavarians are somewhat backward. Notwithstanding the extent and excellence of their pastures, the stock, generally, is of inferior quality, though there are some well known breeds. Improvement in these respects, however, is now in progress, through the instrumentality of agricultural and veterinary schools, which have now been established some time, and which distribute prizes to encourage the breeding of stock. Swine are reared in great numbers in all parts of the country, and poultry and wild fowl are abundant. The wolves and bears, with which the forests of Bavaria were at one time infested, are nearly extinct.—The manufactures of Bavaria are singly not very important, being mostly on a small scale, and conducted by individuals of limited capital. The principal articles manufactured are linens, woollens, cottons, silks, leather, paper, glass, earthen and iron and steel ware, jewelry, &c., but the supply of some of these articles is inadequate to the home consumption. Of leather, paper, glass, and iron-ware, pretty large quantities are exported. The optical and mathematical instruments made at Munich are the best on the Continent, and are prized accordingly. But the most important branch of manufacture in Bavaria is the brewing of beer—the universal and favourite beverage of the country. There are upwards of 6000 brewing establishments in the kingdom, which have been calculated to supply on an average about twenty gallons a year to every individual of the population. The beer is neither so strong nor so sweet as Scotch ale; but is of more delicate flavour, and forms a pleasant and wholesome beverage. It is not only consumed in immense quantities in the country, but is sent to all parts of Germany, and even as far as America and India. Spirits are also largely distilled. A large portion of the industrial population maintain themselves by weaving linen, and by the manufacture of articles in wood (some of which are of beautiful workmanship), and by the felling and hewing of timber. Notwithstanding its favourable geographical position, and other natural advantages, the trade of Bavaria is comparatively limited. Among the exports are corn, timber, wine, cattle, leather, glass, hops, fruit, beer, iron and steel ware, machinery, fancy articles, colours, lucifer matches, stoneware, &c. Among the imports are coffee, cacao, tea, cotton, tobacco, drugs, copper, oil, spices, dye-stuffs, silk and silk goods, lead, &c.—From its position Bavaria enjoys a considerable portion of transit trade, much facilitated by the good roads that traverse the country in all directions. The means of communication are now very complete. The Danube, the Rhine, the Main, the Regnitz, &c., afford ample scope for inland navigation, besides the König Ludwig Canal, which connects the Main

at Bamberg with the Altmühl a short distance above its embouchure in the Danube, thus establishing direct water communication through the Rhine between the German Ocean and the Black Sea. The railway system (now managed as a part of the imperial system of railways) has been carried out on an extensive scale. The lines are partly state property, partly private. The number of miles in operation amounts (1900) to 4050, about 3500 of this total being state railways the remainder private railways. The amount of debt contracted for railways by Bavaria is £50,000,000, forming over four-fifths of the total debt of the country. The receipts from the railways are now generally sufficient to pay the interest and charges on account of this debt. The state also possesses two canals.

Education and Art.—The department of education is under the superintendence of the 'Superior Board of Education and Ecclesiastical Affairs'. A complete system of inspection is established throughout the country; the reports of the inspectors including not only the number and proficiency of the scholars, but also the conduct of the teachers, the state of the buildings, and the nature and extent of the funds available. It is necessary in Bavaria, before admission can be obtained into any higher school, to have passed a satisfactory examination in the lower school. Not only must all candidates for offices under the state pass examinations, but examinations are held of apprentices in trade who wish to become masters, and even of officers in the army on promotion. There are over 8000 schools in Bavaria, attended by more than 800,000 pupils. Attendance on school is compulsory up to fourteen years of age. There are three universities in Bavaria—two of which (Munich and Würzburg) are Roman Catholic, and one (Erlangen) Protestant. The university of Munich is attended by about 3500 students, and has about 170 professors and instructors; that of Würzburg has 80 professors and instructors, and about 1350 students; and that of Erlangen 67 professors and instructors, and about 1100 students. There are also several lyceæ, a number of gymnasia, numerous Latin, normal, and polytechnic schools, besides academies of arts and sciences, fine arts, horticulture, &c. The capital, Munich, contains a library of 800,000 volumes, including 25,000 MSS.; several scientific and literary institutions, academies, and national societies, and extensive collections of works of art.—Bavaria enjoys the honour of having originated a school of painting of a high order of merit, known as the Nurnberg school, founded about the middle of the sixteenth century by Albert Dürer, a native of that town, whose works are little, if at all, inferior to those of his great Italian contemporaries. Hans Holbein, who excelled Dürer in portrait, though far behind him in historical painting, is claimed by Bavaria, but neither the precise locality nor the date of his birth is known with certainty.—Augsburg, Basel, and Grünstadt being severally named as the one, and the dates 1495 and 1498 as the other. To these celebrated names have to be added those of the eminent sculptors Kraft and Vischer, both also Bavarians; the former born about 1435 and the latter about the middle of the same century. The master-piece of the latter distinguished artist is the bronze shrine of St. Sebaldus in Nürnberg, esteemed a marvel of art for beauty of design and delicacy of workmanship. The most celebrated of Kraft's works is the remarkable tabernacle in stone, affixed against one of the columns of the choir of the church of St. Lawrence, also in Nürnberg. The restoration of Bavarian pre-eminence in modern times, in connection with the fine arts, is, in a great measure, if not entirely, owing to Louis I., whose love of art

and liberal patronage have rendered the capital one of the most celebrated seats of the fine arts in Europe.

Religion.—The religion of the state is Roman Catholicism, which embraces more than seven-tenths of the population (in 1895, 4,115,578). The remainder are principally Protestants (1,642,848) and Jews (53,750). The proportion between Catholics and Protestants has scarcely varied during the last three-quarters of a century. All citizens, whatever their creed, are equally admissible to the same public functions and employments, and possess the same civil and political rights. The articles of the concordat concluded with the pope are subordinate in their application to the fundamental law of the state. By an ordinance of Louis I. females are prohibited from pronouncing any monastic vow until after having passed their thirty-third year. The dioceses of Bavaria comprise two archbishoprics, Munich and Bamberg; and six bishoprics, Augsburg, Ratisbon, Eichstätt, Passau, Würzburg, and Spire. The salaries are paid by government. In Bavaria marriage between individuals having no capital cannot take place without the consent of the principal persons appointed to superintend the poor institutions, who, if they grant such liberty where there are no means of supporting the children that may spring from such marriage, render themselves liable for their maintenance. The law is apparently intended to prevent improvident marriages, for which it seems certainly better adapted than for the promotion of morality.

People.—In personal appearance the Bavarians are stout and vigorous, well adapted to bear the fatigues of war, and are in general considered as good soldiers. They are accused of being indolent, and somewhat addicted to drinking, but are brave, patriotic, and faithful to their word. Their manners and customs towards the close of the last century were described as very coarse, and they were said to be deeply imbued with superstitious bigotry; but, since the more general diffusion of knowledge, a great change for the better has taken place. Many of the peasantry wear long loose snuff-coloured coats, lined or edged with pink, and studded in front with silver or white metal buttons, thrown open to display a smart waistcoat of various and brilliant colours; their hats are ornamented with artificial flowers. Many of the Bavarian females are handsome, lively, and graceful. They dress smartly, and display much taste in their attire. Some of them wear black silk handkerchiefs tied tightly round their heads, decorated with flowers or ribbons, some caps of silver or gold tissue, and all having their hair neatly braided. German is the language spoken, with local peculiarities; but they have never been conspicuous for the cultivation of their native tongue.

Constitution.—Bavaria was formerly a member of the Germanic Confederation, and now forms part of the German Empire. The executive is in the hands of the king. The legislature consists of two chambers—one of senators, and one of deputies; the former composed of princes of the royal family, the great officers of the state, the two archbishops, the heads of certain noble families, a bishop named by the king, the president of the Protestant General Consistory, and any other members whom the king may create hereditary peers; the latter, of members chosen indirectly, one to every 31,500 persons of the total population. The qualifications are, that the candidate shall have completed his 30th year, that he shall be a free and independent citizen, that he shall be a member of the Roman or the Reformed Church, and pay direct state taxes. The members are chosen every six years, unless the house is dissolved

by the king, and are generally convened once a year, but are bound to assemble at least once every three years. Each of the eight circles or provinces has a provincial government, consisting of two boards, one for the management of the police, schools, &c., and the other for the management of financial affairs. The revenue for the financial year 1896-97 was 845,856,505 marks or £17,267,825, and the public debt, including railway debt, &c., was 1,382,000,000 marks, or £26,600,000. The army is raised by conscription—every man being liable to serve from the 1st of Jan. of the year in which he completes his 20th year—and it forms an independent part of the army of the German Empire. In time of peace it is under the command of the King of Bavaria, but in time of war it is placed under that of the Emperor of Germany, as commander-in-chief of the whole German army. The period of service is three years in the active force, four in the reserve, and five in the landwehr; and no Bavarian can settle or marry, or accept of any definite appointment, until he has fulfilled his military liabilities. On a peace footing the Bavarian army consists in all of fully 63,000 men and 2600 officers; on a war footing, about twice this number.

History.—The Bavarians take their name from the Boii, a Celtic tribe who inhabited the districts which, when conquered by the Romans, became the Roman provinces of Vindelicia and Noricum. After the fall of the Western Empire this territory was overrun by various Germanic tribes, who formed themselves into a confederation, like that of the Franks and Marcomanni, and called themselves Boiarii. The confederacy of the Boiarii was made tributary first to the Ostrogoths, and then to the Franks. Finally the sovereignty over them was assumed by Charlemagne, and on the death of that monarch the kings of the Franks and Germans governed it by their lieutenants, who bore the title of margrave, afterwards converted into that of duke, and latterly (1623) into that of elector. In 1070 Bavaria passed into the possession of the family of the Guelphs, and in 1180 it was transferred by imperial grant to Otto, count of Wittelsbach. On the extinction of the direct line of that family in 1777, the elector palatine, Charles Theodore, added the Palatinate and the duchies of Juliers and Berg to the Bavarian dominions. In 1799 the duke Maximilian Joseph of Deux-Ponts came into possession of all the Bavarian territories. The peace of Lunéville (Feb. 9, 1801) essentially affected Bavaria. Whilst it lost all its possessions on the left bank of the Rhine, and also the lands of the Palatinate on the right bank, it obtained, on the other hand, by an imperial edict, an indemnification, by which it gained, in addition to the amount lost, a surplus of 2109 square miles, and 216,000 inhabitants.

In 1805 Bavaria was raised, by the treaty of Presburg, to the rank of a kingdom, with some further accessions of territory, all of which were confirmed by the treaties of 1814 and 1815, by which also a great part of the lands of the Palatinate was restored. In 1848 the discreditable conduct of the King of Bavaria, in maintaining an open *liaison* with a wandering actress who had assumed the name of Lola Montez, had thoroughly alienated the hearts of his subjects, and quickened that desire of political change which had previously existed. In this spirit the people, early in March, 1848, demanded the immediate convocation of the chambers, the liberty of the press, that judicial trials should be public, that an electoral reform should be granted, and that the army should take an oath to observe the constitution. The king having refused, tumults occurred, and King Louis announced his resignation

of the sceptre to his son, Maximilian II., under whom the reforms and modifications of the constitution were carried out. Maximilian died in 1864, and was succeeded by Louis II. In the war of 1866 Bavaria sided with Austria, in consequence of which it was obliged, by the treaty of Aug. 22 in the same year, to cede a small portion of its territory to Prussia, and to pay a war indemnity of 80,000,000 florins (£2,500,000). Soon after Bavaria entered into an alliance with Prussia, and in 1867 joined the Zollverein under Prussian regulations. In the Franco-German war of 1870-71 Bavaria took a prominent part, and since 1871 it has been one of the constituent states of the German Empire, being represented in the Bundesrath by six, and in the Reichstag by forty-eight members. In 1886 King Louis II. committed suicide, his mind having completely given way. His brother Otto succeeded, but, being also insane, the kingdom has since been under his uncle Leopold as regent.

BAVIUS, MARCUS, and MÆVIUS, still notorious as two miserable poets and presumptuous critics, satirized by Virgil. The words are often used to signify bad or malevolent poets.

BAXTER, ANDREW, a Scotch philosopher and metaphysician. He was born at Aberdeen in 1686, and was educated at King's College in that city, after which he was employed as a private tutor. About 1738 he published an Enquiry into the Nature of the Human Soul; wherein the Immateriality of the Soul is Evinc'd from the Principles of Reason and Philosophy. In 1741 he went abroad with two of his pupils, and remained for some years at Utrecht, where he contracted an acquaintance with some of the Dutch literati. He returned to Scotland in 1747, and resided at Whittingham, in East Lothian, where he died in 1750. He was the author of a Latin treatise on the principles of astronomy entitled *Matho sive Cosmotheoria, Puerilis Dialogus*, which he afterwards translated into English, and published in two vols. 12mo. He was a staunch friend and correspondent of John Wilkes, then quite a young man.

BAXTER, RICHARD, the most eminent of the English nonconforming divines of the seventeenth century, was born near Shrewsbury, in Shropshire, in 1616. The example of his father gave him a serious turn very early in life. After receiving a somewhat desultory and defective education he was sent to London, under the patronage of Sir Henry Herbert, master of the revels; but he soon returned into the country with a view to study divinity; and, in 1638, received ordination in the Church of England. He in 1640 refused the oath of universal approbation of the doctrine and discipline of the Church of England, usually known as the *et cetera* oath, and in the following year he became minister at Kidderminster, with the best results to the morality of the town. When the civil war broke out he sided with the Parliament, and, after the battle of Naseby, accepted the appointment of chaplain to Colonel Whalley's regiment. He is said to have been, the whole of this time, a friend to the Establishment, according to his own notions. In 1647 he retired, in consequence of ill health, from his military chaplainship, and when he recovered preached against the Covenant. He even endeavoured to persuade the soldiery not to encounter the Scottish troops who came into the kingdom with Charles II., and hesitated not to express an open dislike to the usurpation of Cromwell. The fact is, that Baxter held civil liberty to be of secondary consequence to what he esteemed true religion, and appears, from a sermon preached before Cromwell, to have deemed the toleration of separatists and se-

tares the grand evil of his government. After the Restoration he was made one of the king's chaplains, and a commissioner of the Savoy Conference, to draw up the reformed liturgy. The active persecution of the Nonconformists soon followed; and, upon the passing of the act against conventicles, he retired, and preached more or less openly, as the act was more or less rigidly enforced. After the accession of James II., in 1685, he was arrested for some passages in his Commentary on the New Testament supposed hostile to Episcopacy, and was tried for sedition. The violence of Jeffreys, who would hear neither the accused nor his counsel, produced a verdict of guilty on the most frivolous grounds. He was sentenced to two years' imprisonment, and a heavy penalty, which, after a short confinement, the king remitted. Henceforward Baxter lived in a retired manner till his death, on Dec. 8th, 1691. His wife cheerfully shared all his sufferings on the score of conscience, both in and out of prison. The character of Baxter was formed by his age; his failing was subtle and controversial theology; his excellence, practical piety. In divinity he sought to establish a resting-place between strict Calvinism and high-church Arminianism, by the admission of election and the rejection of reprobation. Christ, he considered, died for some especially, and for all generally; that is to say, all possess the means of salvation. A body called *Baxterians* long acknowledged these distinctions; and the Nonconformist clergy, after the Revolution, were divided between this body, the pure Calvinists, and the high-church passive-obedient Arminians. Baxter was a voluminous writer: his *Saints' Everlasting Rest*, and the *Call to the Unconverted*, have been extraordinarily popular. In 1680 an edition of his *Practical Works* appeared in 23 vols. 8vo. The chief authority for the facts of his life is the *Reliquiæ Baxterianæ* of Sylvester, consisting of autobiographical matter.

BAY, SWEET. See LAUREL.

BAYADERES, in the East Indies, young girls, from ten to seventeen years of age, who are instructed in dancing, singing, and acting little plays. They are trained under the care of women, who are experienced in all female arts, and particularly in that of pleasing. These procure from the lowest classes of the people the most beautiful girls, of seven or eight years of age, and instruct them in all the arts of their profession (especially dancing and singing), the object of which is to amuse the rich and minister to their passions. Their presence is considered necessary even at the smallest public entertainments, though they are known to be mere prostitutes. After their seventeenth year, when their first charms have faded, they retire to a pagoda, under the protection of the Brahmins, who scruple not to pocket the gains of their prostitution. This word is from the Portuguese word *bailadeira*, from *bailar*, to dance.

BAYAMO, or **ST. SALVADOR**, a town of Cuba, on a river which forms a port on the s.e. coast; 520 miles s.e. Havana. The town is about 20 miles distant from the port. It gives name to the channel between the mainland of Cuba and the islands called the Queen's Gardens. Pop. in 1887, 17,876.

BAYARD, or more properly **BAYART**, **PIERRE DU TERRAIL, CHEVALIER DE**, called the *knight without fear and without reproach*, born in 1476, in the castle of Bayard, near Grenoble, was one of the most spotless characters of the middle ages. He was simple and modest; a true friend and tender lover; pious, humane, and magnanimous. The family of Terrail, to which he belonged, was one of the most ancient in Dauphiné, and was celebrated for nobility and valour. Young Bayard, educated under the eyes of

his uncle George du Terrail, bishop of Grenoble, early imbibed in the school of this worthy prelate the virtues which distinguished him afterwards. At the age of thirteen he was received among the pages of the Duke of Savoy, the ally of France. Charles VIII., who saw him at Lyons, in the suite of this prince, was struck with the dexterity with which the youth managed his horse: he begged him of the duke, and committed him to the care of Paul of Luxemburg, count de Ligny. The tournaments were his first field of glory.

At the age of eighteen he accompanied Charles VIII. to Italy, and distinguished himself greatly in the battle at Verona, where he took a standard. At the beginning of the reign of Louis XII., in a battle near Milan, he pursued the fugitives with such eagerness, that he entered the city with them, and was taken prisoner. Ludovico Sforza returned him his arms and his horse, and dismissed him without ransom. Whilst the French were in Apulia, Bayard defeated a Spanish corps, and made their leader, Don Alonso de Sotomayor, prisoner. He treated him with generosity. Sotomayor, however, not only violated his parole by flight, but calumniated Bayard, who, according to the custom of that time, challenged him, and killed him. Afterwards, like Horatius Coclès, he defended a bridge over the Garigliano singly against the Spaniards, and saved the French army by checking the advance of the victorious enemy. For this exploit he received as a coat of arms a porcupine, with the motto *Vires agminis unus habet*. He distinguished himself equally against the Genoese and the Venetians. When Julius II. declared himself against France, Bayard went to the assistance of the Duke of Ferrara. He did not succeed in his plan of taking the pope prisoner; but he refused with indignation an offer made to betray him. Being severely wounded at the assault of Brescia, he was carried into the house of a nobleman who had fled and left his wife and two daughters exposed to the insolence of the soldiers. Bayard protected the family, refused the reward of 2500 ducats which they offered to him, and returned, as soon as he was cured, into the camp of Gaston de Foix, before Ravenna. In an engagement which shortly after ensued he took two standards from the Spaniards, and pursued the fugitives. Gaston, the hope of France, perished through his neglect of the advice of Bayard. In the retreat from Pavia Bayard was again wounded. He was carried to Grenoble; his life was in danger. 'I grieve not for death,' he said, 'but to die on my bed, like a woman.'

In the war commenced by Ferdinand and the Catholic he displayed beyond the Pyrenees the same talents, the same heroism, which had distinguished him beyond the Alps. The fatal reverses which embittered the last years of Louis XII. only added a brighter splendour to the personal glory of Bayard. Henry VIII. of England, in alliance with Ferdinand and Maximilian, threatened Picardy in 1513, and besieged Terouane. The French army disgracefully took to flight. Bayard, with his accustomed intrepidity, made an ineffectual resistance to the enemy: overpowered by superior numbers, his troop was on the point of laying down their arms, when Bayard, perceiving an English officer at some distance from him, immediately galloped towards him, presented his sword to his breast, and cried, 'Yield, or die!' The Englishman surrendered his sword: Bayard immediately gave him his own, saying, 'I am Bayard, and your captive, as you are mine.' The boldness and ingenuity of this action pleased the emperor and the King of England, who decided that Bayard needed no ransom, and that both captives were released from their parole.

When Francis I. ascended the throne, he sent Bayard into Dauphiné to open for his army a passage over the Alps, and through Piedmont. Prosper Colonna lay in wait for him on his march, expecting to surprise him, but Bayard made him prisoner. This brilliant exploit was the prelude to the battle of Marignano, in which Bayard, at the side of the king, performed wonders of bravery, and decided the victory. After this glorious day Francis was knighted with the sword of Bayard. When Charles V. invaded Champagne with a large army, and threatened to penetrate into the heart of France, Bayard defended the weakly-fortified town of Mézières against every assault, until the dissensions of the hostile leaders compelled them to retreat. Bayard was saluted in Paris as the saviour of his country: the king bestowed on him the order of St. Michael, and a company of 100 men, which he was to command in his own name—an honour which till then had only been conferred on princes of the blood. Soon afterwards Genoa revolted from France: Bayard's presence reduced it to obedience. But after the surrender of Lodi fortune changed, and the French troops were expelled from their conquests. Bonnivet was obliged to retreat through the valley of Aosta; his rear was beaten, and himself severely wounded, when the safety of the army was committed to Bayard. It was necessary to pass the Sesia in the presence of a superior enemy, and Bayard, always the last in retreat, vigorously attacked the Spaniards, when a stone from a blunderbuss struck his right side, and shattered his backbone. The hero fell, exclaiming, 'Jesus, my God, I am a dead man!' They hastened towards him. 'Place me under yon tree,' he said, 'that I may see the enemy.' For want of a crucifix he kissed the cross of his sword, confessed to his squire, consoled his servants and his friends, bade farewell to his king and his country, and died April 30, 1524, surrounded by friends and enemies, who all shed tears of admiration and grief. His body, which remained in the hands of his enemies, was embalmed by them, given to the French, and interred in a church of the Minorites, near Grenoble. His monument consists of a simple bust, with a Latin inscription. See Hist. de P. Terrail, dit le Chevalier Bayard, sans Peur et sans Reproche, by Gayard de Berville; the Life by Terrebasse, &c.

BAYAZID. See BAJAZET.

BAYAZID, or BAYEZED, a town, Turkey in Asia, pashalic of, and 140 miles S.E. from Erzeroom, S.W. of Mount Ararat, from the base of which it is separated by a lava-covered plain 10 miles in width. It is situated on the declivity of a rugged eminence, the summit of which is fortified, and surrounded by a wall and ramparts. The town is in a ruinous state; most of the houses are small and ill built, and the streets are in an extremely filthy condition. Besides the extensive palace of the pasha, the town contains two Christian churches, three mosques, and the famous monastery of Kara-Kelesch, celebrated for its beautiful architecture and antiquity. The inhabitants consist chiefly of Kurds and Armenians. Kurdish is the common language of the place. Some trade is carried on with Persia, on the frontiers of which the town is situated. It was occupied and held by the Russians for a time in 1877. Total pop. 5000.

BAYER, JOHN, born at Rhain, in Bavaria, in 1572, practised as an advocate at Augsburg, but devoted his leisure to astronomy, and occupies an important place in its history from having published charts of the stars, in which they are, for the first time, distinguished by letters. His most entitled Uranometria was first published in 1608. In a

second edition, published in 1827, he changed the name to *Coelum Stellatum Christianum*, because he had withdrawn the heathen names of the constellations, and supplied their names by others taken from the Bible, taking those of the northern constellations from the New, and those of the southern constellations from the Old Testament, and giving the names of the twelve apostles to the signs of the zodiac. His letters were adopted by Flamsteed and others, and are now universally used, but the heathen names have kept their ground.

BAYEUX, an ancient town of France, department Calvados, about 16 miles N.W. of Caen. It possesses many antique houses of singular appearance, and has a beautiful cathedral, in the Gothic style, with Romanesque features, dating from the twelfth to the fifteenth century, and having a crypt under the choir several centuries earlier. There is a public library and museum, in which one of the most interesting relics of the middle ages is preserved. (See *BAYEUX TAPESTRY*.) Pop. (1896), 6874.

BAYEUX TAPESTRY, a piece of sewed work originally found in the cathedral of Bayeux, in the library of which town it is still preserved. The fact that such a tapestry existed was brought to light by M. Lancelot, who communicated a description of an illuminated drawing of a portion of it to the Academy of Inscriptions and Belles-lettres in 1724. This led to the discovery of the tapestry itself in 1728, whereupon various speculations arose as to its date, its origin, and its purport. According to tradition it is a contemporary representation of the invasion and conquest of England by the Normans, and the discussions upon it have proved that tradition is right. It is thus not only valuable as a relic of the art of the middle ages, but it has also an historical value, inasmuch as it supplies several details of the great event which it portrays which are not found in the chroniclers, and also gives us an exact picture of Norman costumes and manners. It is supposed to have been worked by the needle of Matilda, queen of William the Conqueror, assisted by her attendants, and to have been presented by Odo, bishop of Bayeux, the half-brother of William, to the church in which it was found. Whether this is so or not, it is regarded as certain that the tapestry is not later than the eleventh century. During the French revolution the tapestry was in great danger of being destroyed. In 1803 it was removed to Paris by order of Napoleon, and when he was meditating the invasion of Britain he caused it to be carried from town to town and exhibited between the acts in the theatres. It was brought back to Bayeux in 1804, when it was placed in the hôtel de ville, instead of the cathedral, its former resting-place. The length of the tapestry is 230 feet, and its height 20 inches. It is in an excellent state of preservation. There are good representations of it produced photographically. See J. C. Bruce's *Bayeux Tapestry* (1885).

BAY ISLANDS, an island group in the Bay of Honduras, off N. coast of state of Honduras, including the islands of Roatan or Roatan, Bonacca, Utila, Barbarete, and Helena. It was incorporated as a British colony in 1852, and was ceded to Honduras in 1859. Pop. about 5000.

BAYLE, PIERRE, author of the *Historical and Critical Dictionary*, was born at Carlat, in the county of Foix (Languedoc), in 1647, and received his first instruction from his father, a Calvinistic preacher. He gave early proofs of an astonishing memory and of a singular vivacity of mind. At the age of nineteen years he entered the College of Puy-Laurens, to finish his studies. The ardour with which he devoted himself to them weakened his constitution. All books were eagerly devoured by him; his taste for

logic led him particularly to study religious controversies, but Amyot's Plutarch and Montaigne were his favourite works. The latter encouraged, without doubt, his inclination to scepticism; perhaps both contributed to give to his style that vivacity, that boldness of expression, and antique colouring, so observable in it. In Toulouse he studied philosophy with the Jesuits. The arguments of his professors, and still more his friendly discussions with a Catholic priest who dwelt near him, confirmed his doubts of the orthodoxy of Protestantism, so that he resolved to change his religion. His conversion was a triumph to the Catholics. His family, however, tried all means to regain him, and after seventeen months he returned to his old faith. In order to escape from the punishment of perpetual excommunication which the Catholic Church then pronounced against apostates, he went to Geneva, and thence to Copet, where Count Dohna intrusted him with the education of his sons, and where he studied the philosophy of Des Cartes. But after some years he returned to France, and settled in Rouen, where he was employed in teaching. From thence he went to Paris, where the society of learned men indemnified him for the fatigues of an occupation to which he was obliged to submit for the third time.

In 1675 he obtained the philosophical chair at Sedan, where he taught with distinction until the suppression of this academy in 1681. He was afterwards invited to discharge the same duties at Rotterdam. The appearance of a comet, in 1680, which occasioned an almost universal alarm, induced him to publish, in 1682, his *Penées Diverses sur la Comète*, a work full of learning, in which he discussed various subjects of metaphysics, morals, theology, history, and politics. It was followed by his *Critique Générale de l'Histoire du Calvinisme de Maimbourg*. This work, received with equal approbation by the Catholics and Protestants, and esteemed by Maimbourg himself, excited the jealousy of his colleague, the theologian Jurieu, whose *Refutation du P. Maimbourg* had not succeeded, and involved Bayle in many disputes. He afterwards undertook a periodical work, *Nouvelles de la République des Lettres*, in 1684.

The death of his father and of his two brothers, together with the religious persecutions in France, induced him to write his *Commentaire Philosophique* on the words of the Gospel: 'Compel them to come in;' which, in regard to style and tone, is not worthy of him. Bayle himself was unwilling to acknowledge it; but Jurieu, who probably recognized its author by the zeal with which toleration is defended in this work, attacked it with violence, and his influence was sufficient to lead the magistrates of Rotterdam to remove Bayle from the office in 1693.

He now devoted all his attention to the composition of his *Dictionnaire Historique et Critique*, which he first published in 1696, in two vols. fol. This was the first work which appeared under his name. Jurieu opposed him anew, and caused the consistory, in which he had the greatest influence, to make a severe attack upon him. Bayle promised to remove everything which the consistory deemed offensive; but finding the public had other views, and preferring the satisfaction of his readers to that of his judges, he left the work, with the exception of a few trifles, unaltered. He found two new enemies in Jaquelot and Le Clerc, who both attacked his religion: others persecuted him as the enemy of his sect and his new country. These contests increased his bodily infirmities. His lungs became inflamed; but he was unwilling to use any medical applications against a disorder which he considered as hereditary and incurable. He died, so to speak, with the pen in his hand, in 1706, at the age of fifty-nine years.

The best editions of his *Dictionnaire Historique* are that of 1740, in four vols. folio (Amsterdam and Leyden), and that in sixteen vols., published in 1820–24 at Paris.

BAYLY, THOMAS HAYNES, song-writer and author, was born at Bath on October 18th, 1797, and early evinced great versifying ability. He began the study of law under his father, and later went to St. Mary Hall, Oxford, in order to prepare for the church; but he abandoned both and devoted himself to literature. He gained great popularity with some songs, and several dramas and novels by him also hit the public taste. He died on April 22nd, 1839, after having been in ill-health for several years. Among his songs some of the best-known are: 'I'd be a Butterfly; The Soldier's Tear; We Met—'twas in a Crowd; and She wore a Wreath of Roses. His best play is *Perfection*; among his novels are *The Aylmers*, and *A Legend of Killarney*. *Loves of the Butterflies*, and *Songs of the Old Château*, are volumes of songs and ballads; and his other works include *Kindness in Women* (a collection of tales), *Parliamentary Letters* and other Poems, and *Rough Sketches of Bath*.

BAYNES, THOMAS SPENCER, LL.D., was born at Wellington, Somersetshire, March, 1823, and died May 29th, 1887. He was educated at Bath, Bristol College, and the University of Edinburgh, where he became (1851–55) assistant to Sir William Hamilton, who was then professor of logic. In 1857 he was appointed examiner in logic and mental philosophy in the University of London; became (1857–64) assistant-editor of the *Daily News*, to which he contributed many noteworthy articles on the American civil war, and at this time he wrote for several literary journals, such as the *Athenæum* and the *Literary Gazette*. In 1864 he was elected professor of logic, rhetoric, and metaphysics in the University of St. Andrews. Besides his contributions to periodicals, such as the *Edinburgh Review*, the *North British Review*, he published a translation of the *Port Royal Logic*, with notes (1851), and an *Essay on the New Analytic of Logical Forms* (1852). He was appointed editor of the ninth edition of the *Encyclopædia Britannica* (being subsequently assisted by Professor Robertson Smith), but the work was still uncompleted at his death. He received in 1874 the degree of LL.D. from the University of Edinburgh.

BAYONET, a straight, sharp-pointed weapon, generally triangular, intended to be fixed upon the muzzle of a rifle or musket, which is thus transformed into a thrusting weapon. It was probably invented about 1640, in Bayonne (though this is doubtful), but was not universally introduced until after the pike was wholly laid aside, in the beginning of the eighteenth century. About 1690 the bayonet began to be fastened by means of a socket to the outside of the barrel, instead of being inserted as formerly in the inside. A variety of the bayonet, called the sword-bayonet, is now pretty widely used in European armies, especially for the short rifles of the light infantry, the carbines of the artillery, &c. It is a compound of the sword and the bayonet, as its name indicates, having a sword-like blade with only one edge, and being capable of being fastened to the muzzle of the gun like the bayonet.

BAYONNE, a well-built city, the largest in the French department of the Basses-Pyrénées, at the confluence of the Nive and the Adour, about 4 miles from the Bay of Biscay. These rivers (which are both navigable) form a harbour capable of admitting vessels of considerable size. They divide the town into three parts, namely, Great Bayonne on the left bank of the Nive, Little Bayonne between the rivers, and St. Esprit on the right bank of the Adour.

A citadel, built by Vauban, on the summit of an eminence in the suburb, commands the harbour and the city. The cathedral is a beautiful building dating from 1218, latterly restored and furnished with two towers. The arsenal, one of the finest in France, and the mint are among the other buildings of Bayonne. Bayonne has a considerable trade. Masts and other timber for shipbuilding, from the Pyrenees, are exported to Brest and other ports of France. The hams of Bayonne are famous. Ships are built, and woollens, chocolate, soap, &c., are manufactured. Among the lower class the ancient Biscayan or Basque language is spoken. Catharine de' Medici had an important interview with the Duke of Alva in Bayonne, June, 1565, at which it is said the massacre of St. Bartholomew was arranged. The meeting of Napoleon with the king of Spain, Charles IV., and the Prince of the Asturias, took place here in May, 1808, when the latter transferred their rights to the Spanish territories in Europe and India to the French emperor. Pop. (1896), 22,278.

BAYREUTH. See **BAIREUTH**.

BAZA (ancient *Basti*), a city of Spain, in the province of and 63 miles E.N.E. from Granada, in a valley north of the Sierra Baza. The environs yield wine and hemp; sheep, cattle, and mules are reared; and there are some manufactures. Baza is famed in early Spanish history, more especially in that of Granada. In 1489 it was taken from the Moors by the Spaniards, after a siege of nearly seven months. In 1810 the French, under Marshal Soult, here defeated the Spaniards under Generals Blake and Freire. Pop. (1897), 11,992.

BAZAR, or **BAZAAR**, a market-place in the East, the word being Arabic in origin. Some are open, some covered over. As the orientals live almost entirely out of doors, the bazars of populous cities, besides their mercantile importance, are of consequence as places of social intercourse. In the oriental tales—for instance, in the *Arabian Nights*—the bazars occupy a very conspicuous place. The word *bazar* has also been imported into Europe, where it is used in much the same sense as in the East. As an English word it is frequently applied to a temporary sale of fancy goods contributed gratuitously, and sold to raise a special fund.

BDELLIUM, a kind of aromatic gum found in different countries, but brought chiefly from Arabia and India. It resembles myrrh in its appearance, and is hence often fraudulently substituted for it. It is obtained from the *Balsamodendron Mokul* and the *B. Roxburgii*. It has a sweet smell but bitter taste, softens readily between the fingers before the fire, and dissolves partially in alcohol, and still more in water. A better variety of bdellium is that produced by the West African *Balsamodendron africanum*; it is used in plasters. The bdellium mentioned in Gen. ii. was apparently a mineral substance entirely different from the gum.

BEACHES, **RAISED**, a term commonly used to designate flat tracts of gravelly and sandy deposits which are situated above the actual sea-shore, but were once covered by the water, and have been elevated within a comparatively recent period. Numerous examples are presented by almost all the shores of Europe, and more especially by those of the British Islands. From the different fossils found in them it is evident that the forces which upheaved them must have been exerted at different periods, but their true dates are not yet ascertained.

BEACHY HEAD, a promontory on the coast of Sussex, about 3 miles S.W. of Eastbourne; height 564 feet. Here a combined Dutch and English fleet, under Lord Torrington, was defeated by a French fleet, under Tourville, in 1690. In 1899

a revolving light was erected here, 285 feet above the level of the sea, visible in clear weather from a distance of 28 miles.

BEACON. See LIGHTHOUSE and SIGNALS.

BEACONSFIELD, BENJAMIN DISRAELI, EARL OF, was born Dec. 21, 1804, and was the eldest son of Isaac D'Israeli (See D'ISRAELI, ISAAC), the well-known author of the *Curiosities of Literature*; his mother also being of Jewish race. Little is known of his early education, though it is certain he never attended a public school or a university. In 1817 he was baptized into the Church of England. While yet a boy he was apprenticed to a firm of attorneys, but he did not long remain in this uncongenial occupation. His father's position gained him an easy entrance into society, and before he was twenty he was a frequenter of such salons as those of Lady Blessington. At this time and later he was noted as a dandy of the first water. In 1826 he published *Vivian Grey*, his first novel, a work which was very popular, and, considering the youth of its author, displays remarkable cleverness and knowledge of the world. He now travelled for some time, visiting Italy, Greece, Turkey, and Syria, and gaining experiences which were afterwards reproduced in his books. In 1831 another novel, *The Young Duke*, came from his pen. It was followed at short intervals by *Contarini Fleming*, *Alroy*, *Henrietta Temple*, *Venetia*, *The Revolutionary Epic* (a poem), &c. His father having acquired a residence near High Wycombe in Buckinghamshire, he attempted to get returned for this borough in 1832. He came forward as a Radical or 'people's' candidate as against the Whigs, and he was supported by the Tories, but was defeated. On this occasion he was recommended to the constituency by Hume and O'Connell. At the general election after the passing of the Reform Bill he again unsuccessfully contested High Wycombe, and the like ill fortune attended him on another attempt in 1835, as also at Taunton the same year. On the latter occasion he appeared in the character of a decided Tory, and his change of political opinions naturally occasioned a good deal of comment. To this period belongs the noted passage of arms between him and O'Connell, which was signalized by a strength of language happily rare between public men in these days. At last, however, he gained an entrance to the House of Commons, being elected for Maidstone in 1837. His first speech in the house was treated with ridicule; he had to stop abruptly and sit down; but he finished with the prophetic declaration that the time would come when they would hear him. In 1839 he married the widow of his colleague in the representation of Maidstone, a lady fifteen years older than himself. At the general election of 1841 he was sent to parliament by Shrewsbury. He had now gained some reputation in parliament, and he was for some years an enthusiastic supporter of Sir Robert Peel. About this time he became a leader of what was known as the 'Young England' party, the most prominent characteristic of which was a sort of sentimental advocacy of feudalism. This spirit showed itself in his two novels of *Coningsby*, or *The New Generation*, and *Sybil*, or *The New Nation*, published respectively in 1844 and 1845. For some years previous to the downfall of Sir Robert Peel in 1846 he was most persistent and bitter in his hostility to this statesman, whom he had so recently supported, being the advocate of protection against the free-trade policy of Sir Robert. His clever speeches of this period greatly increased his reputation, and by 1847 he was recognized as one of the leaders of the Tory party. Having acquired the manor of Hughenden in Buckinghamshire, he was in the above year elected for this county, and he re-

tained his seat till raised to the peerage nearly thirty years later. In 1847 was published his novel of *Tancred, or the New Crusade*, a somewhat extravagant production containing enigmatic allusions to the great 'Asian mystery.' His first appointment to office was in 1852, when he became chancellor of the exchequer under Lord Derby. The following year, however, the ministry was defeated, and Mr. Disraeli again became leader of a Conservative opposition. He remained out of office till 1858, when he again became chancellor of the exchequer with Lord Derby as his chief. As on the former occasion his tenure of office was but short, a reform bill which he had introduced causing the defeat of the government and their resignation after an appeal to the country. During the next six years, while the Palmerston government was in office, Mr. Disraeli led the opposition in the lower house with conspicuous ability and courage. He spoke vigorously against the Reform Bill brought forward in 1866 by the Russell-Gladstone ministry; but when, soon after, he came into power along with his chief Lord Derby, the demand for reform was so urgent that he had to bring in a reform bill himself. Accordingly in August, 1867, a measure by which the parliamentary representation was reformed became law, being piloted through parliament by Mr. Disraeli with remarkable tact and dexterity. In February, 1868, he reached the summit of his ambition, becoming premier on the resignation of Lord Derby, but being in a minority after the general election he had to give up office the following December. In 1874 he again became prime minister with a strong Conservative majority, and he remained in power for six years. This period was marked by his elevation to the peerage in 1876 as Earl of Beaconsfield, and by the prominent part he took in regard to the Eastern Question and the conclusion of the Treaty of Berlin in 1878, when he visited the German capital. In the spring of 1880 parliament was rather suddenly dissolved, and the new parliament showing an overwhelming Liberal majority, he resigned office, though he still retained the leadership of his party. Not long after this, the publication of a novel called *Endymion* (his last, *Lothair*, had been published ten years before) showed that his intellect was still vigorous. His physical powers, however, were now giving way, and he died April 19, 1881, after an illness of some weeks duration. His wife had died in 1872 after having been created Viscountess Beaconsfield. Among others of his writings besides those already mentioned are: *A Vindication of the English Constitution*, 1834; *Alarcos*, a Tragedy, 1839; and Lord George Bentinck, a Political Biography, 1852. Lord Beaconsfield was one of the most remarkable men of the nineteenth century. If not possessed of actual genius, he was endowed with great intellectual power, and he had astonishing tenacity of purpose, and showed remarkable tact and ability in managing men. As a parliamentary speaker and debater he had few rivals, and in wit, sarcasm, epigrams, and other rhetorical devices he was a master. His novels are fatally open to criticism on many grounds, and it is doubtful if they will long maintain the place they at present hold. Their popularity has been largely owing to their author having so frequently introduced real persons into them under a more or less penetrable disguise, and presented them in a more or less favourable light.

BEADLE.—1. An officer in a university, whose chief business is to walk with a mace in a public procession. The universities of Oxford and Cambridge have each three esquire beadles (or bedels), one being attached to each of the faculties of law, medicine and arts, and divinity. The former uni-

verity has also three yeomen beadles, and the latter one.—2. An inferior parish officer, whose business is generally to execute the orders of the vestry, by whom he is appointed. These parochial beadles were originally officers given to the rural deans to cite the clergy and church-officers to visitations, and for other purposes.

BEADS, small perforated ornaments, generally of a round shape and made of glass, but also of gold, silver, and other metals, paste, coral, gems, &c. The use of them as ornaments belongs to very early times. Glass beads are supposed to have been manufactured by the Phœnicians more than 3000 years before Christ. Beads have been found in the ruins of Assyrian temples, also as decorations of the Egyptian mummies, and in the graves of the ancient Greeks, Romans, and Britons. The manufacture of glass beads was introduced into modern Europe by the Italians, and in the neighbourhood of Venice it is still an important branch of industry. On the island of Murano alone several thousand workmen are employed in this manufacture. Birmingham is the chief seat of the manufacture of beads in Great Britain.

BEAGLE, a small species of dog, formerly kept for hunting hares, but now superseded by the harrier. It is stoutly built, with long hanging ears, often white with black or reddish spots.

BEAMING is a preliminary operation in weaving which consists in winding the yarn of the warp on the weaver's beam. After the yarn has by the process of warping been wound from the bobbins on which it is spun into a warp of as many lengths as are required for the breadth of the cloth to be woven, the warp is first wound on a stick into a ball, and from the ball is again wound on the weaver's beam, a comb which is capable of being expanded and contracted to suit the length of the beam being used for the purpose of arranging the threads of the yarn in parallel coils. In power-weaving a machine is used called the beam-warping machine, which works by steam, and performs both the operations of warping and beaming at once. When the beam on which the warp is wound by this machine is filled, it is removed to another machine called the slasher sizing-machine, where it forms one of six or eight filled in the same way. In this machine the contents of these beams, after being sized and dried, are wound upon one beam, which afterwards forms the weaver's beam.

BEAMS, strong transverse pieces of timber stretching across the ship from one side to the other, to support the decks and retain the sides at their proper distance, with which they are firmly connected by means of strong knees, and sometimes of standards. They are sustained at each end by thick stringers on the ship's side called shelf-pieces. The main-beam is next above the main-mast. The greatest beam of all is called the midship beam. A ship is said to be 'on her beam-ends' when it lies entirely on its side, so that the beams are almost at right angles to the surface of the water. An object is said to be 'a-beam' when it is in a line with the beams of the ship, and accordingly at right angles to its length.

BEAN, a plant belonging to the nat. order Leguminosæ, and the sub-order Papilionaceæ. The earliest allusion in ancient history to the bean is contained in the Bible; but the nature of the soil renders it improbable that it was cultivated in Palestine, and the probability is that the beans used by the Jews were brought by them from the alluvial valley of the Nile in Egypt. The bean was likewise well known to the Romans at an early period of their history, and it was probably through them that its

cultivation spread into Northern and Western Europe. The precise period of the introduction of beans into Britain is unknown, but some have supposed that it occurred shortly after the conquest of Spain by the Moors, and that either that country or Portugal furnished the first supply of seed imported to the British Islands. Since then the bean has ramified into many varieties, and formed no inconsiderable item in the list of agricultural and horticultural plants cultivated for the sustenance of man and beast. As an object of rural beauty, gratifying both to sight and smell, few field plants can vie with the bean, laden with its delicately tinted blossoms, exhaling an odour so pleasurable as scarcely to be excelled by the most cherished denizen of the flower-garden.

There are two strongly marked and well-defined varieties of beans, viz. the field-bean (*Faba vulgaris arvensis*) and the garden-bean (*Faba vulgaris hortensis*), both being included botanically under one species. One of the commonest varieties of the field-bean is the common Scotch or horse-bean. This bean is extensively cultivated in Scotland; so much so that it may be considered as the only sort in general cultivation. It is extremely hardy, and very prolific, especially if the weather has been dry and warm while the pods were filling. The straw averages about 4½ feet long when well grown; and the yield per acre, taking in a large extent of land in the bean-growing districts, may be fairly estimated at 30 bushels (imperial measure), the weight ranging from 60 to 66 lbs. per bushel. On the best soils the yield is sometimes as much as 60 bushels per acre. The Scotch-bean seems better suited to the country from which it takes its name than England or Ireland, excluding the more northerly parts of these two countries, where the climate is similar to that of Scotland. The common tick or field-bean occupies the same position in England that the Scotch-bean does in Scotland, and is frequently called the 'horse-bean.' This and the preceding sort are probably from the same stock—soil, climate, and the continued operation of dissimilar causes for a lengthened period producing the difference which now exists between them. The tick-bean is shorter strawed than the Scotch-bean, and said to be fully more prolific, and also better adapted to light soils. Of the other varieties of the field-bean, the commonest are the Helioland bean, a hardy sort adapted for rich alluvial soils; the Russian or winter field-bean, the hardiest of all, and less liable than any other to be attacked by the 'black dolphin,' or bean aphid; the early Mazagan and the long-podded bean, the last two of which are also cultivated as garden-beans. In addition to these varieties of the field-bean there are at present in cultivation at least twenty tolerably well-defined varieties and sub-varieties of the garden-bean, including the early Mazagan, and the different sorts of the long-pod which have already been mentioned as cultivable both in the field and garden.

All soils of an aluminous or clayey nature, when well drained, are adapted to the growth of beans; the best bean soils, however, are those occupying a middle position between the heavy clays and the light loams. Well-drained clays, firm loams, and hard black lands are each of them, both physically and chemically, admirably adapted to the peculiar habits of the bean, and it is only on such soils that its systematic cultivation is at all profitable. They are often sown broadcast but the most profitable method is to sow in rows, the crop being treated by drill-harrowing and hand-hoeing, exactly as in the cultivation of turnips or potatoes. Strong farm-yard manure is the best. The usual time for sowing all kinds of

field-beans, with the exception of the Russian or winter variety, is from the beginning of February to the middle of March. The field-bean, in this country, takes from five and a half to six months to attain maturity, and the winter variety from nine to ten months. The earlier garden sorts, when sown so late in spring as not to receive any serious check from frost, mature their seeds in little more than four months.

The bean plant is subject to many diseases; among the most formidable is the 'blight,' caused by the attacks of a most voracious species of aphid, known more familiarly as the 'black dolphin fly,' or 'collier aphid.' (See APHID.) The ravages of this insect generally commence when the beans are beginning to swell in the pods, the farther development of which is quickly arrested by the destruction of the leaves, which are either quickly devoured, or their tissues riddled through and through, and thus rendered incapable of performing their functions of absorption and assimilation. The most effectual remedy yet discovered for arresting the progress of the 'collier,' when once commenced, is to cut off the tops of the bean stalks as soon as the insect is discovered on the leaves; and as it invariably commences operating at the top, working downwards, the removal of the affected portion saves that which is below.

BEAN-GOOSE (*Anser segetum*), a species of wild goose, distinguished from the true wild goose (*Anser ferus*) by its comparatively small and short bill, which, as far as the nostril, is black, and above it of a reddish flesh colour, whereas that of the gray lag, or true wild goose, is orange-red, with a touch of grayish-white. Large flocks regularly descend to the British Islands from the north, and remain till the beginning of May. They feed generally on high grounds, considerably inland, selecting particularly young wheat, stubbles sown down for grass, and, in spring, fields sown with beans, their fondness for which is supposed to have given them their name. They breed chiefly within the Arctic circle, but their nests are often found in large numbers in Harris and others of the Hebrides. The bean-goose being rather less than the common wild goose, but having the same colour, is sometimes provincially called the small gray goose.

BEAR (*Ursus*, L.), a genus of carnivorous, or, more accurately, frugi-carnivorous, mammiferous quadrupeds, belonging to a family of the Plantigrada, which tread on the entire soles of the feet. The genus is characterized by a heavy body, covered with a thick woolly coat, a large head, terminating in a prolonged snout, with very extensible lips. The ears are of moderate size, and rather pointed, and the tongue smooth. The limbs are large and heavy, and all the feet are five-toed, and furnished with very strong, hooked claws, which are not retractile, and are well suited for burrowing or climbing trees. In the bear family are comprised the racoon, badger, wolverine, glutton, &c. The chief species are the brown bear of Europe (*U. arctos*); the white or polar bear (*U. maritimus*); the American or black bear (*U. americanus*); the grisly bear (*U. horribilis*), also of America; and the long-lipped bear (*U. labiatus*).

The brown bear is chiefly an inhabitant of cold and elevated situations, and feeds on a great variety of animal and vegetable substances. During winter this species, like some others, remains torpid in caves, whither it retires in the autumn very fat, and comes out in the spring extremely emaciated. The brown bear is remarkable for its sagacity, as well as the ferocity of its disposition, and it becomes especially sanguinary as it advances in age. Besides the differences of colour and size which distinguish this bear from those belonging to the old continent, it

differs from the American bears by having a convexity of front above the eyes, which renders its physiognomy strikingly dissimilar to theirs. Other distinctions, sufficiently obvious, present themselves when the species are compared.

The Polar or maritime bear is only found in high northern latitudes, along the borders of the icy Ocean and northern coasts of America in the vicinity of Hudson's Bay. It does not descend to the eastern coast of Siberia nor Kamtschatka; neither is it found in the islands lying between Siberia and America. It is uniformly white, attains a large size, is very powerful, ferocious, and daring. It is an excellent diver and swimmer, being apparently as much at home in the ocean as on land. An individual of this species was seen, by recent northern explorers, in the middle of Melville Sound, swimming across where the shores were at least 30 miles apart. The Polar bear is the most exclusively carnivorous of the genus, though equally capable of living on vegetable food with the rest. He preys upon seals, the cubs of the whale, morse, &c., or the carcasses of whales left by whalers after removing the blubber. Individuals of this species are sometimes, though rarely, seen in caravans of wild animals, where they appear to suffer extremely from heat, as they bathe frequently in water provided for the purpose. When ice is placed in the cage they roll upon it with great satisfaction, and show every sign of being gratified.

The black bear of America is distinguished by its colour and a peculiarly convex facial outline. It is found very generally in mountainous and forest lands, and subsists in a great degree on berries and vegetable substances, though it preys upon small animals and insects, which it searches for industriously, by turning over large logs of decayed timber. It is rarely, if ever, known to attack man, unless in self-defence. It is very fond of young corn, and also of honey, which, being an expert climber, like the brown European bear, it obtains by plundering the wild bees.

The grisly bear inhabits the country adjacent to the Rocky Mountains, and is, of all the race, the most dreadful for size, strength, and terrible ferocity of nature.

The Asiatic or long-lipped bear is a native of the mountainous parts of India, and feeds on white ants, rice, honey, the fruit of the palm, &c. The species is inoffensive and timid, burrows in the ground, and lives in pairs, together with the young, which, when alarmed, seek safety by mounting on the backs of the parents. (See plate at (ARNIVORA).)

BEARD, the hair round the chin, on the cheeks, and the upper lip, which is a distinction of the male sex. It differs from the hair on the head by its greater hardness and its form. The beard begins to grow at the time of puberty. The connection between the beard and puberty is evident from this, among other circumstances, that it never grows in the case of eunuchs who have been such from childhood; but the castration of adults does not cause the loss of the beard. According to Cæsar the Germans thought, and perhaps justly, the late growth of the beard favourable to the development of all the powers. But there are cases in which this circumstance is an indication of feebleness. It frequently takes place in men of tender constitution, whose pale colour indicates little power. The beards of different nations afford an interesting study. Some have hardly any, others a great profusion. The latter generally consider it as a great ornament; the former pluck it out; as, for instance, the American Indians.

The character of the beard differs with that of the individual, and, in the case of nations, varies with

the climate, food, &c. Thus the beard is generally dark, dry, hard, and thin in irritable persons of full age: the same is the case with the inhabitants of hot and dry countries, as the Arabians, Ethiopians, East Indians, Italians, Spaniards. But persons of a very mild disposition have a light-coloured, thick, and slightly curling beard. The same is the case with inhabitants of cold and humid countries, as Holland, Britain, Sweden. The difference of circumstances causes all shades of variety. The nature of the nourishment likewise causes a great variety in the beard. Wholesome, nutritious, and digestible food makes the beard soft; but poor, dry, and indigestible food renders it hard and bristly.

In general the beard has been considered with all nations as an ornament, and often as a mark of the sage and the priest. Moses forbade the Jews to shave their beards. With the ancient Germans the cutting off another's beard was a high offence, with the East Indians it is severely punished. Even now the beard is regarded as a mark of great dignity among many nations in the East, as the Turks. The custom of shaving is said to have come into use in modern times during the reigns of Louis XIII. and XIV. of France, both of whom ascended the throne without a beard. Courtiers and inhabitants of cities then began to shave, in order to look like the king, and, as France soon took the lead in all matters of fashion on the continent of Europe, shaving became general; but it was only from the beginning of the 18th century that shaving off the whole beard became common. Till then fashion had given divers forms of mustaches and beards. It is only in comparatively recent times that beards and mustaches have again become common, the example in this respect having been set by France. It is now rare to see a clean-shaved face, either beard or mustache, or both, being almost invariably worn, and cut according to the taste of the wearer.

Much has been said on the utility of a full beard to persons exposed to breathe air charged with deleterious dust, as masons, &c. It is not to be denied that the mouth, one of the most expressive parts of the countenance, is shown to much better advantage in consequence of shaving; but, at the same time, old age appears to much greater disadvantage, the beard concealing the loss of the teeth. Moreover, the eye gains much in expression by a full beard. Every one knows the trouble of shaving; and who does not remember Byron's computation of the amount of this trouble in Don Juan? Seume, a German author, says, in his journal, "To-day I threw my hair-powder apparatus out of the window: when will come the blessed day that I shall send the shaving apparatus after it." Perhaps the best description of the miseries of shaving is to be found in the *Noctes Ambrosianæ*.

Shaving, among many ancient nations, was the mark of mourning; with others, it was the contrary. Plutarch says that Alexander introduced shaving among the Greeks, by ordering his soldiers to cut off their beards; but it appears that this custom had prevailed before among the Macedonians. The Romans began to shave about 484 A.U., 296 B.C., when a certain Titinius Menus, a barber from Sicily, introduced this fashion. Scipio Africanus was the first who shaved every day. The day that a young man first shaved was celebrated, and the first hair cut off was sacrificed to a deity. Hadrian, in order to cover some large warts on his chin, renewed the fashion of long beards; but it did not last long. In mourning the Romans wore a long beard, sometimes for years. They used scissors, razors, tweezers, &c., to remove the beard. The public barbers' shops (*tonstrinæ*), where the lower classes

went, were much resorted to; rich people kept a shaver (*tonsor*) among their slaves.

BEAR LAKE, THE GREAT, an extensive sheet of fresh water in the north-west part of North America, on the Arctic Circle, between about 65° and 67° 32' N. lat.; and under the 20th degree of W. lon. It is of irregular shape, and measures 170 miles north to south and east to west. Its area is estimated at 11,200 square miles, and its average depth is said to be 270 feet. The water is remarkably transparent, and appears of a light-blue colour. It abounds with fish, particularly with a kind known by the name of 'the herring salmon of Bear Lake'. The Bear Lake River flows from it to the Mackenzie River.

BEARN, before the revolution a province of France, at the foot of the Pyrenees, with the title of a principality; about 42 miles long and 36 broad; bounded E. by Bigorre, N. by Armagnac, Tursan, and Chalosse, W. by Dax, a part of Soule, and the Lower Navarre, and S. by the Pyrenees. It belonged, with Navarre, to Henry IV., when he obtained the crown. The plain country is very fertile, and the mountains are covered with fir-trees, while within are mines of copper, lead, and iron; and the little hills are planted with vines, which yield good wine. It is now chiefly included in the department of Lower Pyrenees. Pau is the chief town. There is a peculiar and well-marked dialect—the Bearnese—spoken in this district, which has much more affinity with the Spanish than with the French. It contains a certain number of Greek elements, which some believe to have been derived from the ancient Greek colonists established in Gaul. The people have retained many old-world manners, customs, and superstitions, as well as their old costume. Pop. about 400,000.

BEAS, or BIAS (the ancient *Hyphasis*), one of the great rivers of the Punjab, having its rise at the Katanki Pass, on the south side of the Sanch Mountain, a branch of the Himalaya system, in lat 32° 21' N.; lon. 77° 22' E.; where the former attain an elevation of 18,300 feet. From this point the Beas flows generally in a south direction for about 50 miles, when it turns west and north-west till it reaches the eastern margin of the Punjab, a distance of about 90 miles, when it proceeds S.S.W. for 75 miles, forming throughout that space the east boundary, and is then joined by the Sutlej, about 8 miles N.N.E. from Sohraon; lat. 31° 10' N.; lon. 75° 2' E. Its entire course is thus about 215 miles. The Beas has been considered larger than the Sutlej, but it is greatly inferior to that river in the length of its course; and, according to Burnes, though they have about the same breadth each—200 yards—the Sutlej has the greater volume of water. The united stream, below the point of junction, is called the Ghara or Gharra.

BEATIFICATION, in the Roman Catholic Church an act by which the pope declares a person beatified or blessed after his death. It is the first step to canonization, that is, the raising one to the honour and dignity of a saint. No person can be beatified till fifty years after his or her death. All certificates or attestations of virtues and miracles, the necessary qualifications for sainthood, are examined by the Congregation of Rites at Rome. This examination often continues for many years, and embraces a number of different steps or stages, at one of which a functionary known popularly as the 'devil's advocate' brings forward all possible objections, and points out all weak points in the evidence brought forward in favour of the reputed saint. When the question has been finally debated in successive meetings of the congregation, the pope

at last gives his decision, and the beatification may then take place in the Vatican church. Beatification differs from canonization in this, that 'whence the cultus of a canonized Saint belongs to the universal Church, and churches and altars can be freely erected in his or her honour, and images, pictures, or statues of him or her displayed without special permission, in the case of one of the Blessed it is otherwise. The honour and veneration which are authorized in their regard are limited and partial; and because the cultus of one of them is permitted to one country, or city, or order, or branch of an order, it does not follow that it should be practised elsewhere; and the attempt to extend it without special permission is condemned.' Addis & Arnold's Catholic Dictionary. See CANONIZATION.

BEATON, DAVID, Archbishop of St. Andrews, and cardinal, celebrated in Scottish history, was born in 1494, a son of John Beaton of Balfour, and a nephew of James Beaton, Archbishop of St. Andrews. He studied at St. Andrews, Glasgow, and Paris, was for years Scottish resident in France, and in 1537 was consecrated bishop of Mirepoix in that country. Pope Paul III. raised him to the cardinalate in 1538, and next year he became primate of Scotland. He had much influence with James V., and after his death (1542) he set himself to oppose the English party, to which the Reformers belonged. Upon the coronation of the young Queen Mary, he was made chancellor, and became also legate *a latere* from Rome. He now began to renew the persecution of heretics, and among the rest the famous Protestant preacher George Wishart suffered, being strangled and burnt at the stake, the cardinal looking on with apparent exultation. But a conspiracy had been formed against him, and he was assassinated at his own castle of St. Andrews, on the 29th May, 1546. He united with great talents equally great vices, and left several children, the fruit of open concubinage.

BEATSON, ROBERT, a laborious miscellaneous writer, born at Dysart, in Scotland, 1742; died at Edinburgh, 1818. He followed the military profession, and served as lieutenant in the attack on Martinique and the taking of Guadeloupe. He afterwards, in his latter years, held the situation of barrack-master at Aberdeen. His publications were, A Political Index to the Histories of Great Britain and Ireland; Naval and Military Memoirs of Great Britain (1790, three vols. 8vo, 2d edit. 1804, six vols.); View of the Memorable Action of the 27th July, 1778 (1791, 8vo); Essay on the Comparative Advantages of Vertical and Horizontal Windmills (1798, 8vo); Chronological Register of Both Houses of Parliament from 1706 to 1807 (1807, three vols. 8vo).

BEATTIE, JAMES, LL.D., a pleasing poet and miscellaneous writer, was born at Laurencekirk, in the county of Kincardine, in 1735. He lost his father when he was only seven years of age, but was placed early at the only school his birth-place afforded, whence he was removed to Marischal College, Aberdeen. He there studied Greek under the principal, T. Blackwell, and made a general proficiency in every branch of education, except mathematics. In 1753 he obtained the degree of A.M., and accepted the office of schoolmaster and parish-clerk to the parish of Fordoun, looking forward to the Church of Scotland as his principal prospect, for which reason he still attended, during winter, the divinity lectures at Marischal College. In June, 1758, these views were somewhat changed by the attainment of the situation of one of the masters of the grammar-school of Aberdeen. In 1760 he published a volume of poems, which were received favourably, but which he subsequently thought very little of, and endeavoured to buy up. The same year the patronage of

powerful friends obtained him the appointment of professor of moral philosophy and logic at Marischal College. In 1765 he published a poem, the Judgment of Paris (4to), which proved a failure, although it was afterwards added to a new edition of his poems in 1766.

The work which procured him the greatest fame was his Essay on Truth, which first appeared in 1770. It was so popular that, in four years, five large editions were sold; and it was translated into several foreign languages. Among other marks of respect, the University of Oxford conferred on the author the degree of LL.D.; and George III. honoured him, on his visit to London, with a private conference and a pension. He was also solicited to enter the Church of England by flattering proposals from the Archbishop of York and the Bishop of London; which proposals he declined, lest his opponents should attribute the change to self-interest. The popularity of this celebrated essay, which was written in opposition to the prevalent scepticism of Hume and others, was principally owing to its easiness of style, and to a mode of treating the subject calculated for the meridian of slight scholarship and medium intellect. This is often a great source of immediate celebrity; but, thus produced, it is usually as transitory as spontaneous, which has proved the case in the present instance.

A few months after the appearance of the Essay on Truth, he published (1771) the first book of the Minstrel (4to), and in 1774, the second; which pleasing poem is, indisputably, the work by which he will be the longest remembered. To a splendid edition of his Essay on Truth, published by subscription, in 1776, he added some miscellaneous dissertations on Poetry and Music, Laughter and Ludicrous Composition, &c. In 1783 he published Dissertations, Moral and Critical (4to); and in 1786 appeared his Evidences of the Christian Religion (two vols. 12mo). In 1790 he published the first volume of his Elements of Moral Science, the second of which followed in 1793; and to the latter was appended a dissertation against the slave-trade. His last publication was an Account of the Life, Character, and Writings of his eldest son, James Henry Beattie, an amiable and promising young man, who died at the age of twenty-two, in 1790. This great affliction was followed, in 1796, by the equally premature death of his youngest and only surviving son, in his eighteenth year; which losses, added to the melancholy loss of reason by his wife, who wholly subdued his constitution; and, after two paralytic strokes, he died at Aberdeen, in August, 1808. Beattie was a religious and an amiable man, but constitutionally more calculated for a poet than a philosopher; and for a pleader than a controversialist. He was, however, a respectable, if not a strong writer, and is now perhaps less read than he deserves.

BEAUCAIRE, a small, well-built, commercial city of France, with 7858 inhabitants, in the department of the Gard, on the right bank of the Rhone opposite Tarascon, with which it communicates by a fine suspension-bridge, at the commencement of the Beaucaire and Aigues-Mortes Canal, and connected with several lines of railway. It has a commodious harbour for vessels which come up from the Mediterranean, seven leagues distant, and has considerable commerce and some manufactures; but is chiefly famous for its great fair (founded in 1217, by Raymond II., count of Toulouse), held yearly from the 21st to the 28th July. Merchants from all parts of Europe, and even from the coast of Africa, attend with their goods; and almost every kind of article, however rare, is to be purchased here; though silks, woollens, printed cottons, leather, wool, wine, brandy

olive-oil, and fruits, are the chief objects of sale. Sales are effected to the amount of about 80,000,000 francs a year, and the number of strangers amounts to 80,000 or 100,000. These are partly obliged to camp out in a meadow on the banks of the river.

BEAUFORT, HENRY, natural son of John of Gaunt, and half-brother of Henry IV., king of England, was made Bishop of Lincoln, whence he was translated to Winchester. He was also nominated chancellor of the kingdom, and sent ambassador to France. In 1426 he received a cardinal's hat, and was appointed legate in Germany. In 1431 he crowned Henry VI. in the great church of Paris. He died at Winchester, 1447. Shakspeare depicts him in his Henry VI., but it is questionable whether the likeness is true to history.

BEAUGENCY, a town of France, in the department Loiret, 16 miles s.w. of Orleans, agreeably situated on the side of a hill, on the right bank of the Loire, which is here crossed by a stone bridge of twenty-six arches. The town was formerly surrounded by a wall flanked by towers and bastions, parts of which still remain. The square donjon tower of Beaugency, 115 feet high, is a remarkable structure of high antiquity, probably of the tenth or eleventh century, though the exact date of its erection is unknown. The articles manufactured here are principally cloth and leather. There are also some distilleries and a considerable trade in wine. In the Franco-German war General Chanzy was defeated here by the Grand-duke of Mecklenburg on the 7th and 8th Dec., 1870, on the latter of which days the town was occupied by the Germans. Pop. (1896), 3305.

BEAUHARNAIS, ALEXANDRE, VISCOUNT DE, was born in 1760 in Martinique. He served with distinction as major in the French forces under Rochambeau which aided the United States in their revolutionary war, and married Joséphine Tascher de la Pagerie, who was afterwards the wife of Napoleon. At the breaking out of the French revolution he was chosen a member of the National Assembly, of which he was for some time president, and which he opened, after the king's departure, with the following words:—*‘Messieurs, le roi est parti cette nuit; passons à l'ordre du jour’*. In 1792 he was general of the army of the Rhine, and in 1793 refused the appointment of minister of war. In consequence of the decree removing men of noble birth from the army, he retired to his country-seat. He was falsely accused of having promoted the surrender of Mainz, and was sentenced to death, and guillotined July 23, 1794, when thirty-four years old. (For information respecting his son Eugene, and his elder brother François, see next two articles; respecting his daughter Hortense, see BONAPARTE, LOUIS.)

BEAUHARNAIS, EUGENE DE, Duke of Leuchtenberg, Prince of Eichstadt, ex-viceroy of Italy, was born September 3, 1781. He was the son of Alexandre Beauharnais (see above), who was guillotined in 1794, and Joséphine Tascher de la Pagerie, afterwards wife of Napoleon and Empress of France. During the French revolution Eugene entered the military service, and at the age of ~~two~~ ^{three} years accompanied his father when he took command of the army of the Rhine. After his father's death he joined Hoche in La Vendée, and subsequently studied for a time in Paris. In 1796 Joséphine was married to Napoleon Bonaparte, then commander-in-chief of the army of Italy, and Eugene accompanied his father-in-law in his campaigns in Italy and Egypt. He was promoted to a high rank in the service, and in 1805 was created a prince of France and viceroy of Italy. After the peace of January 18, 1806, he married the Princess Augusta Amelia of Bavaria. In 1807 Napoleon made him Prince of Venice, and

declared him his heir to the kingdom of Italy. He administered the government of Italy with great prudence and moderation, and was much beloved by his subjects. In the war of 1809 he was at first unsuccessful against the Archduke John, but soon afterwards gained the battle of Raab, and distinguished himself at Wagram. He conducted himself with great prudence on the occasion of the divorce of Napoleon from his mother. In the Russian campaign he commanded the fourth corps d'armée, and distinguished himself in the battles of Ostrowno, Mohilo, and that on the Moskwa (Borodino). In the disastrous retreat he did not desert the wrecks of his division for a moment, but shared its toils and dangers with the soldiers, and encouraged them by his example. To him and to Ney France was indebted for the preservation of the remains of her army during that fatal retreat. On the departure of Napoleon and Murat he was left in the chief command, and showed great talent at that dangerous conjuncture. We find him again at the battle of Lützen, of May 2, 1813, where, by surrounding the right wing of the enemy, he decided the fate of the day. Napoleon sent him from Dresden to the defence of Italy, now menaced by the enemy's forces, where military operations commenced after the dissolution of the congress of Prague, and the accession of Austria to the league of the allied powers. Eugene maintained the defence of Italy even after the desertion of Murat. After the fall of Napoleon he concluded an armistice with Count Bellegarde, by which he delivered Lombardy and all upper Italy to the Austrians. Eugene then went immediately to Paris, and thence to his father-in-law at Munich. He was at the Congress of Vienna. On the return of Napoleon from Elba he was obliged to leave Vienna and retire to Baireuth. He was an inactive spectator of the events in 1815. By an ordinance of the king of Bavaria, his father-in-law, he was created Duke of Leuchtenberg, November, 1817. The Bavarian principality of Eichstadt was bestowed upon him, and his posterity declared capable of inheriting in case of the failure of the Bavarian line. He died at Munich, February 21, 1824, leaving two sons and four daughters. Prince Eugene, under a simple exterior, concealed a noble character and great talents. Honour, integrity, humanity, and love of order and justice were the principal traits of his character. Wise in the council, undaunted in the field, and moderate in the exercise of power, he never appeared greater than in the midst of reverse, as the events of 1813–14 prove. See *Vie Politique et Militaire d'Eugène Beauharnais*, Vicoirol d'Italie, by Anbriet (second edition, Paris, 1825); also *Mémoires et Correspondance* (10 vols., 1858–60).

BEAUHARNAIS, FRANÇOIS, MARQUIS DE, was born at La Rochelle, August 12, 1756. He violently opposed the motion of his younger brother, the Viscount Alexandre, to take from the king the chief command of the army, and would not listen to any of the amendments proposed, saying, *‘Il n'y a point d'amendement avec l'honneur’*. He was called in consequence of this, *Le fidèle Beauharnais sans Amendement*. In 1792, with the Count d'Hervilly, the Baron de Viomenil, and others, he formed the project of a new flight of the royal family; but the arrest of his companion, the Baron Chambon, prevented the execution of the plan. He was appointed major-general in the army of the Prince of Condé, and wrote, in 1792, to the president of the National Assembly, protesting against their unlawful treatment of the king, and offering to appear himself among his defenders. When Bonaparte became first consul, the marquis sent him a letter, in which he exhorted him, by the glory which he would gain by such a course, to re-

store the sceptre to the house of Bourbon.' Having at last recognized the emperor, he was sent by him as ambassador to Florence and Madrid; but having afterwards fallen into disgrace he was banished. After the restoration he returned to Paris, where he died JANUARY 10, 1819.

BEAUMARCHAIS, PIERRE AUGUSTIN CARON DE, the author of the Barber of Seville, and Marriage of Figaro, was born at Paris in 1732. He was the son of a watchmaker, who destined him for his trade. He early gave striking proofs of his mechanical and also of his musical talents. He was afterwards the teacher on the harp of the daughters of Louis XV., and was admitted into their society. By a rich marriage he laid the foundation of the immense wealth which he afterwards accumulated by his speculations, and which was also increased by a second marriage. In the meantime he occupied himself with literature and published the dramas of *Eugénie* in 1767, and *Les Deux Amis* in 1770. The first still holds its place on the stage. He showed all his talents in his lawsuit against Goetzman and Lablache, when he wrote against the former (who belonged to the *parlement Maupeou*, so called, which was engaged in a dispute with the ministry) his celebrated *Mémoires* (Paris, 1774), which entertained all France. He did not gain his suit however. The fame of his *Mémoires* alarmed even Voltaire, who was jealous of every kind of glory. The Barber of Seville (1775) and the Marriage of Figaro (1784) have given him a permanent reputation. In 1792 he wrote *La Mère Coupable*, but never regained his former fame. His last work was *Mes Six Époques*, in which he relates the dangers to which he was exposed in a revolution in which a celebrated name, talent, and riches, were sufficient causes of proscription. He still possessed, at the age of more than sixty, all the vigour of his youth, but was afflicted with deafness. He lost about a million livres by his famous edition of the works of Voltaire (1785), which, notwithstanding its immense cost, was very imperfectly executed. He lost still more at the end of 1792 by his attempt to provide the French army with 60,000 muskets. Discontented with the present, despairing of the future, wearied with struggling against the revolution and his creditors for the ruins of his wealth, he died at the age of sixty-seven years without any particular disease, in May, 1799. In 1809 an edition of his works appeared in seven vols., a later edition in one vol. came out in 1835. Beaumarchais was a singular instance of versatility of talent, being at once an artist, politician, projector, merchant, and dramatist. He was passionately fond of celebrity. His Marriage of Figaro excited one of those extraordinary sensations for which Paris has always been remarkable. The English modifications and versions of this comedy convey but a slight notion of the mischievous subtlety and deep spirit of intrigue in the original.

BEAUMARIS, a seaport town, North Wales, Isle of Anglesey. It is situated on the w. shore of the Menai Strait, near its junction with the Irish Sea, where it expands into a good roadstead called Beaumaris Bay; lat. 53° 18' N.; lon. 4° 5' W. It consists of several streets, well paved and clean; houses in general good, particularly in the principal street, which is terminated by the ancient castle of Beaumaris, erected by Edward I.; while many modern dwellings of very handsome appearance have lately arisen in various parts of the town and vicinity. The chief public buildings, exclusive of the churches, are the town-hall, a commodious and handsome edifice, the county-hall, the grammar-school, police office, and public library. The places of worship comprise the church of St. Mary, a spacious and elegant structure in the later style of English archi-

ture, with a lofty, square, embattled tower; and several chapels. The harbour is safe and commodious, and may be entered at any state of the tide. Beaumaris is now a favourite watering-place. Prior to 1885 it was one of a group of parliamentary boroughs. Pop. in 1891, 2302; in 1901, 2310.

BEAUMONT, FRANCIS, and FLETCHER, JOHN, two eminent English dramatic writers, of whose lives but little is known. The former was born in 1586, ten years after the latter, and died in 1615, ten years before him. His family had its seat at Grace-Dieu, in Leicestershire, where he was born, and his father became a judge of the Common Pleas. He entered Broadgate Hall (now Pembroke College), Oxford, as a gentleman-commoner in 1598, and afterwards studied law for a short time at the Inner Temple. At the age of sixteen he published a translation, in verse, of Ovid's fable of Balmacis and Hermaphroditus, and before nineteen became the friend of Ben Jonson. He married Ursula, daughter and co-heir of Henry Isley of Sundridge, in Kent, by whom he left two daughters. He was only twenty-nine years old when he died. He was buried near the entrance of St. Benedict's Chapel, in Westminster Abbey, but his resting-place is marked by no monument. Several of the Beaumont family were distinguished as poets, among whom we may mention Sir John Beaumont, the elder brother of the dramatist, who wrote Bosworth Field, and improved our rhyme couplet, and Francis Beaumont, a cousin of the dramatist.—**JOHN FLETCHER** was born in London in 1578. His father was a dignitary of the church, who, after having been dean of Peterborough, was appointed Bishop of London. The poet was admitted to Bennet's College, Cambridge, in 1591, where he is said to have acquired a large amount of classical lore. The *Woman-Hater*, produced in 1606-7, is the earliest work known to exist in which he had a hand, but it is probable that he wrote before this. Little is known of the circumstances in which his life was passed. It does not appear that he was ever married. He died in London of the plague in his forty-ninth year, Aug. 1625, and was buried at St. Saviour's, Southwark. Two cousins of his, Giles and Phineas Fletcher (which see), also distinguished themselves as poets. The friendship of Beaumont and Fletcher, like their literary partnership, was singularly close; they lived in the same house, and are said to have even had their clothes in common. The works that pass under their names consist of fifty-two plays, a masque, and some minor poems. The masque was written by Beaumont alone, and it is believed that all the minor poems except one are his also. He is said to have had a share in only seventeen of the fifty-two plays, but it is difficult and indeed impossible to determine with certainty the respective shares of the two poets in these productions. According to the testimony of some of their contemporaries, Fletcher was the inventing genius, while Beaumont, though the younger, was more distinguished for maturity and correctness of judgment. Shakespeare was their model, and, like him, they intermix pathetic and low comic scenes; but their attempts to surpass their model sometimes lead them into extravagances. Shakespeare is believed by some critics to have had a hand as well as Fletcher in the composition of the fine play of the Two Noble Kinsmen, founded on Chaucer's *Knight's Tale*. The desire of pleasing the public at times induces them to deviate from a correct standard of taste. Their contemporaries preferred them even to Shakespeare, affirming that the English drama reached its perfection in them. Impartial posterity has reversed this decision, and adjudged the palm to Shakespeare.

Their writings are greatly disfigured by coarseness and indecency. They are said to have frequented taverns and alehouses to study the human character, and to have been arrested while disputing in such a place respecting the conclusion of a play. One wished to have the king in the piece to be assassinated, the other opposed it; and being overheard, they were apprehended on suspicion of conspiring the death of their sovereign. Among the best of their plays are the tragedies of Valentinian, Thierry and Theodoret, King and No King, Philaster, and the Maid's Tragedy; the comedies *Rule a Wife and Have a Wife*, *Wit without Money*, *The Knight of the Burning Pestle*, *The Spanish Curate*, *The Scurful Lady*, and the pastoral tragi-comedy in rhyme of the *Faithful Shepherdess*.

BEAUMONT, SIR GEORGE HOWLAND, born of an ancient family in Leicestershire in 1753, possessed considerable skill as a landscape-painter, but was noted more especially as a munificent patron of the arts. The establishment of the National Gallery was mainly owing to his exertions, and sixteen of its fine paintings, chiefly landscapes, including one by N. Poussin, three by Claude, and the *Blind Fiddler* of Wilkie, were his gifts. He died in 1827.

BEAUMONT, SIR JOHN, poet, was born in Leicestershire in 1682. He was an elder brother of Francis Beaumont, the dramatist, and studied at Broadgates Hall (now Pembroke College), Oxford. In 1605 he succeeded to his father's estates on the death of his elder brother. He began writing poetry at a comparatively early age, and in 1602 published anonymously a mock-heroic piece entitled *The Metamorphosis of Tobacco*. He was created a baronet in 1626, and died probably in 1627. In 1629 his son, Sir John, published a collection of his poems under the title *Boworth Field*, with a *Taste of the Variety of other Poems left by Sir John Beaumont*.

BEAUMONT, JOSEPH, English poet, was born at Hadleigh, Suffolk, on March 13th, 1616, and educated at the grammar-school of his native place, and at Peterhouse College, Cambridge, where he gained great distinction. Elected a fellow in 1636, he was ejected with others in 1644 owing to royalist sympathies, and while living in retirement wrote *Psyche*, an epic poem, published in 1648. In 1646 he was appointed canon of Ely; and in 1650 he married and again went into retirement in order to devote himself to poetic composition. On the restoration of the monarchy he became a royal chaplain, and after a brief term as master of Jesus College he was appointed in 1663 master of Peterhouse. He received the regius professorship of divinity at Cambridge in 1674. His death took place on Nov. 28th, 1699.

BEAUNE, a town of France, in the department Côte d'Or, on the Bouzeise, at the foot of a hill, 23 miles s.w. of Dijon. It is surrounded with planted ramparts, which furnish a pleasant promenade; is well built, and has a handsome church of Notre Dame, dating from the twelfth century, and a large hospital, founded in 1443 by Nicholas Rollin, chancellor of Philip the Good, duke of Burgundy. Beaune has also a public library containing about 50,000 vols. with 500 manuscripts, a very fine public garden, a theatre, &c. Its manufactures, though still of some importance, have never recovered the shock which they received by the revocation of the Edict of Nantes, when 200 Calvinistic families, who gave employment to 2000 workmen, were driven into exile. The trade is chiefly in the Burgundy wines of the district, and in agricultural produce. There is a statue, erected in 1849, to the mathematician Monge, who was born here. Pop. (1896), 11,808.

BEAUREGARD, PIERRE GUSTAVE TOUTANT, Confederate general in the American civil war, was born near New Orleans on May 28th, 1818. After studying military science at West Point he joined the artillery, but was afterwards transferred to the engineers. In the Mexican war of 1846-7 he distinguished himself, and was promoted major; in 1853 he became captain. On the outbreak of the civil war he offered his services to the south, and was placed in command of the city of Charleston, South Carolina. On April 12th, 1861, he reduced Fort Sumter, and later in the same year he led the Confederates to victory in the battle of Bull Run. At the battle of Shiloh in the following year he assumed the command on the death of General A. S. Johnston, but though very successful on the first day he was ultimately compelled to retreat to Corinth, Miss., which he had to evacuate shortly afterwards. From September, 1862, till April, 1864, he defended Charleston against the siege operations of General Gillmore and Admirals Dupont and Dahlgren. In Oct., 1864, he became commander of the military division of the west, in which capacity he strove without success to resist Sherman's victorious advance, and in April, 1865, he and J. E. Johnston surrendered. He was afterwards a railroad director, adjutant-general of Louisiana, and manager of the Louisiana State Lottery, and died at New Orleans on Feb. 20th, 1893.

BEAUSOBRE, ISAAC DE, born in 1659 at Niort in France, studied at Saumur, and being of a good family, with powerful connections, was at first intended for the law. His own inclinations were decidedly in favour of the church; and in 1683 he became Protestant minister of Châtillon-sur-Indre. In the persecuting spirit of the time the church had been closed by fixing the royal seal upon the gate. Beausobre held special services in his own house, and being for this reason obliged to flee, sought an asylum at Rotterdam. Shortly after he became chaplain to the Princess of Anhalt at Dessau, which he quitted in 1694, when he became minister to French Protestants at Berlin. He enjoyed much of the favour both of Frederick William I. and of the crown-prince, afterwards Frederick the Great, and died at Berlin in 1738. His most remarkable work is the *Histoire Critique de Manichée et du Manichéisme* (1734); and he also wrote *Histoire de la Réformation* (4 vols. 1785-6).

BEAUTY, THE BEAUTIFUL. See *ÆSTHETICS*.

BEAUVAIS (ancient *Bratuspantium*, *Belloracum*), a town of France, capital of the department of Oise, 54 miles N. of Paris. It stands in a rich valley inclosed by wooded hills, at the confluence of the Avelon with the Thérain; and though poorly built, derives great interest from its antiquity. It existed in the time of the Romans, and in 1472 resisted an army of 80,000 Burgundians under Charles the Bold. The principal edifice is the unfinished cathedral, which has the loftiest choir in the world, and beautifully painted glass, executed by the most celebrated masters of the art. The choir was built in 1225-72. The town-house is the finest modern structure. The principal manufacturing establishment is the Gobolins branch tapestry and carpet manufactory, famed for the beauty of its products, and employing about 400 hands; and there are also manufactures of woollens, buttons, brushes, gold and silver lace, &c. It has also large bleachfields, tanneries, and dye-works. Beauvais is the seat of a bishop, and had a population in 1896 of 16,371.

BEAUVOIS, AMBROSE JOSEPH PALIBOT DE, a French naturalist of some note, was born at Arras in 1752. He visited Africa, the West Indies, and America, in connection with his favourite pursuits in

natural history, and was rewarded by the discovery of the jaws and molar teeth of the great mastodon, on the banks of the Ohio. He afterwards returned to France, and devoted the remainder of his life to the arrangement and publication of his collections. Comparatively few of them had arrived in safety, but out of the wreck he managed to procure materials for the important publications on which his fame chiefly rests. The most valuable is his *Flore d'Oware et de Benin*, in twenty parts folio. One of the most curious plants contained in it has been named after him *Belvisia*. He died in 1820.

BEAVER (*Castor fiber*), a quadruped of the order Rodentia, or gnawers, the only species of its genus. It is very widely distributed, being found in the northern parts of Europe, Asia, and America, now-ays most abundantly in the northern and thinly peopled parts of North America, dwelling in communities on the banks of rivers and lakes. It is only in a state of nature that the beaver displays any of those singular modes of acting which have so long rendered the species celebrated. These may be summed up in a statement of the manner in which they secure a depth of water that cannot be frozen to the bottom, and their mode of constructing the huts in which they pass the winter. They are not particular as to the site which they select for the establishment of their dwellings, but if it is in a lake or pond, where a dam is not required, they are careful to build where the water is sufficiently deep. In standing waters, however, they have not the advantage afforded by a current for the transportation of their supplies of wood, which, when they build on a running stream, is always cut higher up than the place of their residence, and floated down. The materials used for the construction of their dams are the trunks and branches of small birch, mulberry, willow, and poplar trees, &c. They begin to cut down their timber for building early in the summer, but their edifices are not commenced until about the middle or latter part of August, and are not completed until the beginning of the cold season. The strength of their teeth, and their perseverance in this work, may be fairly estimated by the fact that they commonly cut down trees of the diameter of six, seven, or eight inches, and in some cases a good deal more. The trees are cut in such a way as to fall into the water, and then floated towards the site of the dam or dwellings. Small shrubs, &c., cut at a distance, they drag with their teeth to the stream, and then launch and tow them to the place of deposit. At a short distance above a beaver dam the number of trees which have been cut down appears truly surprising, and the regularity of the stumps might lead persons unacquainted with the habits of the animals to believe that the clearing was the result of human industry.

The figure of the dam varies according to circumstances. Should the current be very gentle, the dam is carried nearly straight across; but when the stream is swift, it is uniformly made with a considerable curve, having the convex part opposed to the current. Along with the trunks and branches of trees they intermingle mud and stones, to give greater strength; and when dams have been long undisturbed and frequently repaired they acquire great solidity, and their power of resisting the pressure of water, ice, &c., is greatly increased by the willow and birch occasionally taking root, and eventually growing up into something like a regular hedge. The materials used in constructing the dams are secured solely by the resting of the branches, &c., against the bottom, and the subsequent accumulation of mud and stones by the force of the stream or by the industry of the beavers.

The dwellings of the beavers are formed of the same materials as their dams, are very rude, and adapted in size to the number of their inhabitants: seldom more than four old, or six or eight young ones, are found in one of the lodges, though double that number have been sometimes seen. In building their houses they place most of the wood crosswise, and nearly horizontally, observing no other order than that of leaving a cavity in the middle. Branches projecting inwards are cut off with their teeth, and thrown among the rest. The houses are not of sticks, and then plastered, but of all the materials used in the dams—sticks, mud, and stones, if the latter can be procured. This composition is employed from the foundation to the summit. The mud is obtained from the adjacent banks or bottom of the stream or pond near the door of the hut. The beaver always carries mud or stones by holding them between his fore-paws and throat. Their work is all performed at night, and with much expedition. When straw or grass is mingled with the mud used in building, it is an accident owing to the nature of the spot whence the mud is obtained. As soon as any portion of the materials is placed, they turn round and give it a smart blow with the tail. The same sort of blow is struck by them on the surface of the water when they are in the act of diving. The outside of the hut is covered or plastered with mud late in the autumn, and after frost has begun to appear. By freezing it soon becomes almost as hard as stone, effectually excluding their great enemy the wolverene during the winter. Their habit of walking over the work frequently has led to the absurd idea of their using the tail as a trowel. The houses are generally from 4 to 6 feet thick at the apex of the cone; some have been found as much as 8 feet thick at top. The door or entrance is always on the side farthest from land, and is near the foundation or a considerable depth under water: this is the only opening into the hut. The large houses are sometimes found to have projections of the main building thrown out, for the better support of the roof, and this circumstance has led to all the stories of the different apartments in beaver huts. These larger edifices, so far from having several apartments, are double or treble houses, the parts having no communication except by water. It is a fact, that the musk-rat is sometimes found to have taken lodgings in the huts of the beaver. The otter also occasionally intrudes here, however, is a dangerous guest, for, should provisions grow scarce, it is not uncommon for him to devour his host. All the beavers of a community do not co-operate in fabricating houses for the common use of the whole. The only affair in which they have a joint interest, and upon which they labour in concert, is the dam. Beavers also make excavations in the adjacent banks, at regular distances from each other, which have been called *washes*. These are so enlarged within, that the beaver can raise his head above water to breathe without being seen, and when disturbed at their huts they immediately swim under water to these washes for greater security, where they are easily taken by the hunters.

The food of the beaver consists chiefly of the bark of the aspen, willow, birch, poplar, and occasionally alder: to the pine it rarely resorts, unless from severe necessity. They provide a stock of wood from the trees first mentioned during summer, and place it in the water opposite the entrance into their houses.

At one time immense numbers of these animals were killed for their fur, which was largely used in making hats, but in more recent times they have suffered less persecution on this account, their fur now not being held in the same estimation.

The beaver is about two feet in length; its body thick and heavy; the head compressed, and somewhat arched at the front, the upper part rather narrow; the snout much so. The eyes are placed rather high on the head, and the pupils are rounded; the ears are short, elliptical, and almost concealed by the fur. The skin is covered by two sorts of hair, of which one is long, rather stiff, elastic, and of a gray colour for two-thirds of its length next the base, and terminated by shining, reddish-brown points; the other is short, thick, tufted, and soft, being of different shades of silver-gray or light lead colour. The hair is shortest on the head and feet. The hind legs are longer than the fore, and are completely webbed. The tail is ten or eleven inches long, and, except the part nearest the body, is covered with hexagonal scales. The part next the body is covered with hair like that on the back. The beaver was formerly an inhabitant of Britain, but has long been extinct. It is still found in some parts of Europe (Norway) and in Northern Asia. See plate at RODENTIA.

BECCAFUMI, DOMENICO, surnamed *Mecherino*, a celebrated painter, born near Sienna in 1486, was leading the humble life of a shepherd, and amusing himself with drawing figures on the sand, when a wealthy individual, from whom he takes the name of Beccafumi, discovered his genius, and sent him to study drawing at Sienna. He there saw, admired, and tried to imitate the paintings of Perugino; but having heard much of Raphael and Michael Angelo, he obtained means from his patron to travel to Rome. After remaining for some time to study the masterpieces of the Vatican he returned to Sienna, and enriched its churches with many noble frescoes and other paintings. He drew and coloured well, possessed strong inventive powers, was thoroughly acquainted with perspective, and excelled particularly in foreshortening, but he was not free from a kind of mannerism, and his heads are in general deficient both in dignity and beauty. He died at Sienna in 1551, and was buried with pomp in its cathedral, among some of the finest monuments of his genius. His paintings include St. Catherine receiving the Stigmata (Sienna), Madonna and Child (Berlin), Marriage of St. Catherine (Rome), &c. He also gained distinction as a sculptor and engraver.

BECCARIA, CESARE BONERANA, MARCHESE DI, author of the well-known Treatise on Crimes and Punishments, was born at Milan in 1735 (or 1738). He was early excited, by Montesquieu's *Lettres Persanes*, to the cultivation of his philosophical talents, and was afterwards favourably known as a philosophical writer by his memorable work full of a noble philanthropy, *Dei Delitti e delle Pene* (On Crimes and Punishments), 1764, and several others. With the eloquence of true feeling and a lively imagination he opposes capital punishments and torture. This work led to the establishment of more correct principles of penal law, and contributed to excite a general horror against inhuman punishments. He is also known in Italy as the author of a philosophical grammar and theory of style, *Ricerche intorno alla Natura dello Stilo* (Milan, 1770), and of several good treatises on style, on rhetorical argument, &c., contained in the journal *Il Caffè*, edited by him in conjunction with his friends Visconti, Verri, and others. In 1768 a chair of political philosophy was created for him at Milan. A fit of apoplexy put an end to his useful life in November, 1794.

BECCARIA, GIOVANNI BATTISTA, an ingenious practical philosopher, was born in 1716 at Mondovì. He went to Rome in 1732, where he studied, and afterwards taught grammar and rhetoric; at the same time he applied himself with success to mathematics. He was appointed professor of philosophy

at Palermo, and afterwards at Rome. Charles Emanuel, king of Sardinia, invited him to Turin in 1748, to fill the professorship of natural philosophy at the university there. He paid much attention to the subject of electricity, and in 1785 published his *Dell' Eletticismo Naturale ed Artificiale* (Turin). He wrote many other valuable works on this subject. In 1759 the king employed him to measure a degree of the meridian in Piedmont. He died April 27, 1781.

BECCLES, a municipal borough of England, county of Suffolk, situated 33 miles N.W. from Ipswich, on the right bank of the Waveney, consists of several well-paved and well-lighted streets, uniting in a spacious market-place; houses in general well built; supply of water ample. It has a handsome new town-hall (the old one being now used as a library and literary institute), a court-house (formerly a jail), a corn hall, and a hospital (built 1874). The church of St. Michael, erected in the fourteenth century, is a spacious and elegant structure in the perpendicular style of English architecture, with a fine detached tower and beautiful porch. There are, besides, chapels for Independents, Baptists, Wesleyans, and Primitive Methodists. It contains a grammar-school, founded in 1712, a boys' school and another school founded (the former in 1631) by Sir John Leman. An estate of 958 acres belongs to the municipality. Beccles maintains an active carrying trade in coals and corn coastwise by the Waveney. Steamers trade direct with London. A good deal of malting is likewise carried on in the vicinity; and there are corn-mills, a coach-factory, agricultural implement works, and manufactures of pottery, bricks, tiles, and tobacco-pipes. Beccles got a charter of incorporation from Henry VIII. in 1543. The environs abound in beautiful scenery. Pop. in 1881, 5721; in 1891, 6669; in 1901, 6898.

BECCERRA, GASPARD, Spanish artist, was born at Baeza, in Andalusia, in 1520, and died at Madrid in 1570. He was for some time in Rome studying under Michael Angelo and others; and on his return became sculptor and painter to Philip II. He adorned the palace of Madrid with several frescoes; and he also executed works in sculpture and architecture.

BECHÉ. See *DE LA BECHÉ*.

BECHÉ-DE-MER. See *HOLOTURIA*.

BECHER, JOHN JOACHIM, the son of a clergyman, was born at Spoyer in 1635. After having travelled and resided in various parts of Germany, Holland, Italy, Sweden, and Great Britain, investigating the mines in Cornwall and in Scotland, and having filled various offices, he died in 1682, some say in London, others in Germany. He wrote a number of works on chemistry, the chief of which is entitled *Physica Subterranea*. In it he expounds his views on the composition of inorganic bodies, the constituents of which, according to him, are three earthy principles, the vitrifiable, the combustible, and the mercurial. The metals consist of these three earths in different proportions, and whenever a metal is calcined the combustible and mercurial earths are expelled, and the vitrifiable earth forms the residual calx. When these principles are combined with water different salts are formed, and a fundamental acid, which exists in all the others. This theory was subsequently developed by Stahl, who, by means of the principle of *phlogiston*, explained not only the calcination of metals, but the phenomena of combustion in general. See *STAHL*.

BECHSTEIN, JOHN MATTHEW, an eminent naturalist, born in 1757 at Waltershausen, in the principality of Gotha, studied theology for four years at Jena, but never felt himself in his element unless

when he was hunting in the fields or roaming the forest. After teaching for some time he resolved to devote himself to his favourite pursuits, when, in 1800, the Duke of Saxe-Meiningen made him director of the Forest Academy of Dreisackacker, in the vicinity of his capital. This academy under Bechstein's management became one of the most celebrated establishments of the kind in Germany. He died in 1822. His chief work is his *Natural History of Germany*, in four vols. In Britain he is best known by a treatise on singing birds.

BECHUANALAND, an extensive British territory in South Africa, so named from its chief inhabitants, the widely spread race of people called Bechuanas. It may be said to extend from the Orange river on the south to the Zambesi on the north, having German South-West Africa on the west and the Transvaal and Matabeleland on the east. The Bechuanas belong to the great Kaffro race, and are divided into tribal sections, each of which has a chief. Many of them live in villages or towns, some of which are of considerable size. They work with skill in iron, copper, and ivory, and engage in husbandry, cattle-breeding, and hunting. Generally speaking the country of the Bechuanas is flat and grass-covered, all the grasses being of a quality which withstands drought, as want of water is a general feature of the region—a great part of the Kalahari desert being included in it. Some parts of the country are wooded and well watered, and in others, where the surface water is scarce, there is a large supply underground. Gold, lead, silver, and iron have been found. The country is considered to be well adapted for cattle, and wheat and maize might also be grown, but irrigation would often be necessary. It lies from 3000 to 5000 feet above sea-level, and the climate is healthy. The southern portion of Bechuanaland (about 52,000 square miles) between the Orange and Molopo rivers, previously a crown colony, was handed over to Cape Colony in 1895. The population in 1891 was 60,376, of whom 5254 were Europeans. The northern portion remains a protectorate. Among the most important of the tribes of this region are the Bamangwato, the Bangwaketse, and the Bakwenas. The chiefs of these tribes, Khama, Bathoen, and Sebele, visited Britain in 1895, and with them it was arranged that each was to have a separate territory, their country being put under the direct authority of the Queen, represented by a resident officer; that the chiefs continue to rule their own people; and that a strip of land should be set aside for the railway passing north to Matabeleland. This railway is an extension of the line from Cape Town via Kimberley, and it has been opened for traffic all the way to Bulawayo, the route being by Vryburg, Mafeking, and Palapye. Outside the area allotted to the chiefs, the country is to be administered by the British South Africa Company. The Bechuanas became known to Europeans about the beginning of the nineteenth century, and missionaries have long been settled among them. The first mission was established at Kuruman, nearly 200 miles north of the Orange, and this place continues to be the chief centre of the Bechuana missions. Dr. Livingstone laboured among the Bechuanas for some years. Vryburg and Mafeking are important stations on the railway; and Khama's capital, Palapye, is also of importance. The Bechuanas were much harassed by the Boers till taken under British protection in 1885. They have to some extent been affected by the recent Boer war.

BECKET, THOMAS, the most celebrated Roman Catholic prelate in the English annals, was born in London in 1117 or 1118. He was the son of Gilbert,

a London merchant. His mother is said to have been a Saracen lady, to whose father Gilbert was prisoner in Jerusalem, having become a captive during the Crusades. The lady is said to have fallen in love with the prisoner, to have assisted him in obtaining his liberty, and afterwards to have followed him to London, where she found him by repeating the only two European words she knew, 'London' and 'Gilbert'. So runs the legend. After studying at Oxford and Paris, Becket was sent, by the favour of Theobald, archbishop of Canterbury, to study civil law at Bologna in Italy, and on his return was made Archdeacon of Canterbury and Provost of Beverley. His claim to the good opinion of Theobald was founded on his skill in negotiation shown in a matter of the highest importance to England—the soliciting from the pope of the prohibitory letters against the crowning of Rostace, the son of Stephen, by which that design was defeated. This service not only raised Becket in the esteem of the archbishop, but in that of King Henry II., and was the foundation of his high fortune. In 1158 he was appointed high-chancellor and preceptor to Prince Henry, and at this time was a complete courtier, conforming in every respect to the humour of the king. He was, in fact, his prime companion, had the same hours of eating and going to bed, held splendid levees, and courted popular applause. In 1159 he made a campaign with the king in Toulouse, having in his own pay 700 knights and 1200 horsemen; and it is said he advised Henry to seize the person of Louis, king of France, shut up in Toulouse without an army. This counsel, however, so indicative of the future martyr, being too bold for the lay counsellors of one of the boldest monarchs of the age, was declined. In the next year he visited Paris to treat of an alliance between the eldest daughter of the King of France and Prince Henry, and returned with the young princess to England. He had not enjoyed the chancellorship more than four years when his patron Theobald died, and King Henry was so far mistaken as to raise his favourite to the primacy, on the presumption that he would aid him in those political views, in respect to church power, which all the sovereigns of the Norman line embraced, and which, in fact, caused a continual struggle until its termination by Henry VIII. It has been asserted that Becket told the king what he was to expect from him; but there is evidence to prove his eagerness to obtain the dignity, and the disgust entertained by Henry, at the first symptoms of the real temper of the man whom he had been so anxious to promote, is against this statement.

Becket was consecrated archbishop in 1162, and immediately affected an austerity of character which formed a very natural prelude to the part which he meant to play. Pope Alexander III. held a general council at Tours in 1163, at which Becket attended and made a formal complaint of the infringements by the laity on the rights and immunities of the church. On his return to England he began to act in the spirit of this representation, and to prosecute several of the nobility and others holding church possessions, whom he also proceeded to excommunicate. Henry, an able and politic monarch, was anxious to recall certain privileges of the clergy, which withdrew them from the jurisdiction of the civil courts; and it was not without a violent struggle, and the mediation of the pope, that Becket finally acquiesced. The king soon after summoned a convocation or parliament at Clarendon, to the celebrated 'constitutions' of which, although the archbishop swore that he would never assent, he at length subscribed, and alleging something like force for his excuse, by way of penance suspended himself from his archiepiscopal

cepal functions until the pope's absolution could arrive. Finding himself the object of the king's displeasure, he soon after attempted to escape to France; but being intercepted, Henry, in a parliament at Northampton, charged him with a violation of his allegiance, and all his goods were confiscated. A suit was also commenced against him for money lent him during his chancellorship, and for the proceeds of the benefices which he had held vacant while in that capacity. In this desperate situation he with great difficulty and danger made his escape to Flanders, and, proceeding to the pope at Sens, humbly resigned his archbishopric, which was, however, restored. He then took up his abode at the Abbey of Pontigny, in Normandy, whence he issued expostulatory letters to the King and bishops of England, in which he excommunicated all violators of the prerogatives of the church, and included in the censure the principal officers of the crown. Henry was so exasperated that he banished all his relations, and obliged the Cistercians to send him away from the Abbey of Pontigny; from which he removed, on the recommendation of the King of France, to the Abbey of Columbe, and spent four years there in exile.

After much negotiation a sort of reconciliation took place in 1170, on the whole to the advantage of Becket, who, being restored to his see, with all its former privileges, behaved on the occasion with excessive haughtiness. After a triumphant entry into Canterbury the young Prince Henry, crowned during the lifetime of his father, transmitted him an order to restore the suspended and excommunicated prelates, which he refused to do, on the pretence that the pope alone could grant the favour, although the latter had lodged the instruments of censure in his hands. The prelates immediately appealed to Henry in Normandy, who in a state of extreme exasperation exclaimed, 'What an unhappy prince am I, who have not about me one man of spirit enough to rid me of a single insolent prelate, the perpetual trouble of my life!' These rash and too significant words induced four of the attendant barons, Reginald Fitz-Urse, William de Tracy, Hugh de Morville, and Richard Broto, to resolve to wipe out the king's reproach. Having laid their plans, they forthwith proceeded to Canterbury, and having formally required the archbishop to restore the suspended prelates, they returned in the evening of the same day (Dec. 29, 1170), and placing soldiers in the courtyard, rushed with their swords drawn into the cathedral, where the archbishop was at vespers, and advancing towards him threatened him with death if he still disobeyed the orders of Henry. Becket, without the least token of fear, replied that he was ready to die for the rights of the church; and magnanimously added, 'I charge you in the name of the Almighty, not to hurt any other person here, for none of them have been concerned in the late transactions.' The confederates then strove to drag him out of the church; but not being able to do so, on account of his resolute deportment, they killed him on the spot with repeated wounds, which he endured without a groan.

The conduct of Henry, and the consequences of this assassination, form a part of English history wherein the discerning student will perceive the subtle policy of the court of Rome, which eagerly availed itself of this opportunity to advance its general object, with a due regard to the power of Henry and his strength of character. The perpetrators of the deed, on taking a voyage to Rome, were admitted to penance, and allowed to expiate their enormity in the Holy Land.

Thus perished Thomas Becket in his fifty-second

year, a martyr to the cause which he espoused, and a man of unquestionable vigour of intellect. He was canonized two years after his death, and miracles abounded at his tomb. In the reign of Henry III. his body was taken up and placed in a magnificent shrine erected by Archbishop Stephen Langton; and of the popularity of the pilgrimages to his tomb the *Canterbury Tales* of Chaucer will prove an enduring testimony.

BECKETT, GILBERT ABBOT A', a noted writer in the departments of light literature, was the son of a London solicitor in Golden Square, and was born in the year 1810. He was originally destined for the profession of a barrister, but having been left to his own resources when very young, he united himself with a band of talented friends and sought a subsistence by the labours of his pen. For many years he was connected with various satirical journals—the *Cerberus*, the *Beacon*, and others, all now forgotten, but which enjoyed a considerable circulation in the days when Punch was not. He also wrote leaders for the *Herald* and the *Times*; and having been connected with the management first of the *Tottenham Court* and afterwards of the *St. James' theatres*, produced several farces and burlesques which achieved a fair amount of success. On the establishment of Punch Mr. A'Beckett became one of its leading contributors, and many of the inimitable parodies and social caricatures which characterize the early volumes of that periodical are of his authorship. About this time he resumed his legal studies, was called to the bar, and having formed an acquaintance with Mr. Buller, the eminent statesman, was appointed member of a commission for reporting on the operation of the poor-laws, in which capacity he displayed great solidity and judgment, and furnished government with a very able report. The result of the reputation thus acquired was his nomination, in 1849, to the post of one of the metropolitan magistrates, an office which he likewise filled with great ability. In the summer of 1866 he had proceeded with his family to Boulogne-sur-Mer to enjoy his annual relaxation from magisterial duties, when he was there suddenly attacked by fever, which carried him off on the 28th of August. In addition to the works above referred to, Mr. A'Beckett was also the author of the *Comic Blackstone*, the *Comic History of England*, and the *Comic History of Rome*, all of which enjoyed much popularity at the time, though the taste for such productions has since then greatly declined.

BECKFORD, WILLIAM, an English writer famous in his time for his immense wealth, his eccentricities, and his literary talents. He was the son of Alderman Beckford, and was born in London in 1761. In his tenth year the death of his father left him in the possession of estates which are said to have yielded him an income of more than £100,000 a year. Under the direction of Lord Chatham he received a careful education, and at an early age gave evidence of unusual abilities. His first work, a satirical essay entitled *Biographical Memoirs of Extraordinary Painters*, in which he ridiculed the English artists of his time, was published before he was twenty years of age. After this he spent some time in travelling over different parts of the Continent, an account of which he published half a century later with the title, *Italy*, with *Sketches of Spain and Portugal* (London, two vols. 1834). On his return to England he entered the House of Commons for a short time as member for Hindon, but he soon became tired of this career, and again withdrew to Portugal, where he bought an estate in the neighbourhood of Cintra, and where he lived in familiar intercourse with the royal family of Portugal. After

the lapse of some years he appeared again in England, and began in 1796 to erect a splendid edifice upon his estate of Fonthill, which he furnished with more than royal luxury, and continually enlarged with new buildings. Here he resided till 1822, when, owing to the loss of two large estates, which had been successfully claimed in Chancery by other owners, he was obliged to sell Fonthill for £330,000. He then settled at Bath, where he began to occupy himself anew with building and collecting works of art. He died at Bath May 2d, 1844. His literary fame rests upon his eastern tale *Vathek*, which he wrote in French, and published at Lausanne in 1784, and a translation of which into English appeared at London without his knowledge in 1786. The tale is still much read, and upon Byron it made a great impression. He says of it:—'For correctness of costume, beauty of description, and power of imagination, this most eastern and sublime tale far surpasses all European imitations; and bears such marks of originality, that those who have visited the East will have some difficulty in believing it to be more than a translation.'

BECKMANN, JOHN, for almost forty-five years professor of philosophy and economy in Gottingen, was born at Hoya in 1739. In 1763 he was appointed professor of the Lutheran gymnasium in St. Petersburg. In 1766 he became professor in Gottingen, where he lectured with great success. Beckmann died in 1811, being a member of most of the learned societies of the north of Europe. There are a number of text-books, in the different sciences above-mentioned, by him. Among his other works is a *History of Inventions* (Leipzig, 1780–1806, five vols.)

BECSKEREK, two towns, Hungary, Banat.—1. BECSKEREK NAGY, or GREAT BECSKEREK, province of Thither Theiss, county Torontal, capital of the district of same name, on left bank of the Bega, 45 miles s.w. from Temesvar, with which it communicates by the Bega Canal. It possesses important privileges as a market town, is the seat of several district offices, and contains a Roman Catholic (parish) and a Greek Non-united church. Pop. 22,000.—2. BECSKEREK KIS, or LITTLE BECSKEREK, county Temes, and 10 miles n.w. from Temesvar. It is inhabited by Germans and Wallachians. The former have a Roman Catholic and the latter a Greek Non-united church. Pop. 3263.

BED, in gunnery, the frame of timber or planks in which cannon, mortars, &c., are placed, to give them a steady and even position, necessary for aiming.

BEDA, or BEDE, an eminent ecclesiastic of the eighth century, usually called the *Venerable Bede*, was born in the year 672 or 673, in the neighbourhood of Wearmouth, in the bishopric of Durham. From the age of seven to that of nineteen he pursued his studies in the monastery of St. Peter, at Wearmouth. Being then ordained deacon, he was employed in the task of educating the youth who resorted to the monastery for instruction, and pursued his own studies with unremitting ardour. In his thirtieth year he was ordained priest; and his fame for zeal and erudition reaching the ears of Pope Sergius, he was invited to Rome, but in consequence of the death of that pontiff never went there. It is not even certain that he ever left Northumberland, which of course reduces the incidents of his life to his literary pursuits and domestic occupations, as he accepted no benefice, and never seems to have interfered in civil transactions. His church history was completed in 731. His last literary labour was a translation of the Gospel of St. John into Saxon, which he completed, with difficulty, on the very day and hour of his

death. The manner of the death of this virtuous ecclesiastic was striking and characteristic. He was dictating his translation of the Gospel of St. John to an amanuensis. The young man who wrote for him said, 'There is now, master, but one sentence wanting; upon which he bade him write quickly; and when the scribe said, 'It is now done,' the dying sage ejaculated, 'It is now done,' and a few minutes afterwards expired in the act of prayer on the floor of his cell, in the sixty-third year of his age, in the month of May, A. D. 785.

The writings of Bede were numerous and important, considering the time in which they were written and the subjects of which they treat, which extended to ecclesiastical affairs, religion, and education. His *Ecclesiastical History of England*, *Historia Ecclesiastica Gentis Anglorum*, is the greatest and most popular of his works, and has acquired additional celebrity by the translation of King Alfred. The collections which he made for it were the labour of many years. Besides his own personal investigations he kept up a correspondence with the monasteries throughout the heptarchy, to obtain archives and records for his purpose; and thus nearly all the knowledge possessed of the early state of Christianity in his country is due to Bede. There have been several editions of the original Latin, which is easy, although not elegant. Probably the best editions are those of Dr. Smith (Cambridge, 1722), Stevenson (London, 1838), Dr. Hussey (Oxford, 1846), and that in Giles's complete edition of his works (with translation, London, twelve vols. 1842–44). The earliest translation of the history into modern English is that of Thomas Stapylton, D.D. (Antwerp, 1565). Bede was also the author of many works, a catalogue of which he subjoined to his history. Several of these were printed early; but the first general collection of his works was that of Paris, 1544–45, six vols. fol. Another edition in six vols. was published at the same place in 1554, and others were subsequently published at Basel and Cologne. While the number and variety of the writings of Bede show the extent of his erudition, his probity, moderation, and modesty insured him general respect; and his disinterestedness is proved by the fact that he was never anything but an unbeneficed priest. A letter of advice which he wrote late in life to Egbert, archbishop of York, proves at once the purity of his morals, the liberality of his sentiments, and the excellence of his discernment; his wish being to curtail the number of monasteries, and to increase the efficacy and respectability of the secular clergy. Notwithstanding the veneration with which he was regarded, not a single miracle is recorded of him; and as monks were the great miracle-mongers, and his views of monastic reform such as we have mentioned, this is not surprising.

BEDARIEUX, a town, France, department Herault, 18 miles n. from Beziers, agreeably situated on the left bank of the Orb, which separates it from one of its suburbs. It is well built, the streets conveniently laid out, and is one of the busiest and most thriving commercial and manufacturing towns of the same size in France. It has manufactures of fine and common cloth, woollen stuffs, and floss silk, worsted and cotton stockings, hats, soap, olive-oil; tanneries, dye-works, paper and glass works, and a brass foundry. It has also a trade in wine and brandy. Pop. (1896), 5459.

BEDDOES, THOMAS, a physician and author, born 1760 at Shiffnal in Shropshire; died 1808. He was educated by his grandfather. He made great progress at school in classical studies, and distinguished himself at Oxford by his knowledge of ancient and modern languages and literature. The

great discoveries in physics, chemistry, and physiology irresistibly attracted him. He continued his studies with success in London and Edinburgh. In his twenty-sixth year he took his doctor's degree, afterwards visited Paris, and formed an acquaintance with Lavoisier. On his return he was appointed professor of chemistry at Oxford. There he published some excellent chemical treatises, and *Observations on the Calculus, Sea-scurvy, Consumption, Catarrh, and Fever*. But, dazzled by the splendid promises of the French revolution, he offended some of his former admirers, and excited such a clamour against him by the publication of his political opinions, that he determined to resign his professorship, and retired to the house of his friend Mr. Reynolds, in Shropshire. There he composed his *Observations on the Nature of Demonstrative Evidence*, in which he endeavours to prove that mathematical reasoning proceeds on the evidence of the senses, and that geometry is founded on experiment. He also published the *History of Isaac Jenkins*, which was intended to impress useful moral lessons on the labouring classes in an attractive manner. Above 40,000 copies of this popular work were sold in a short time. After he had married, in 1794, he formed the plan of a pneumatic institution, for curing diseases, particularly consumption, by means of factitious airs or gases. He succeeded, with the assistance of the celebrated Wedgewood, in opening this institution in 1798. He engaged as superintendent of the whole, young Humphry Davy, the foundation of whose future fame was laid here. The chief purpose of the institution, however, was never realized, and Beddow's zeal gradually relaxed, so that he relinquished it one year before his death, after having published a number of valuable works upon the application of factitious airs. In the last years of his life he acquired the reputation of the best medical writer in Great Britain, particularly by his *Hygiea*, in three vols., a popular work which contains passages of extraordinary eloquence. His political pamphlets from 1795-97 are forgotten.

BEDDELL, WILLIAM, a celebrated Irish bishop, born at Black Notley in Essex in 1570, studied at Cambridge, became minister of St. Edmundsbury in Suffolk, and in 1604 went to Venice as chaplain to the ambassador, Sir Henry Wotton. Here he remained for eight years, and became intimately acquainted with the celebrated Fra Paolo Sarpi, who taught him Italian, and was taught theology in return. While here Bedell translated the English Prayer-book into Italian. On his return to England Bedell resumed the duties of his curacy, but left it in 1616 for the living of Horingsheth. Here he remained for twelve years, and quitted it to become provost of Trinity College, Dublin, a situation which he would have declined had not the king expressly commanded his acceptance of it. The wisdom of this choice was soon justified by the important reforms which Bedell undertook and successfully accomplished, through the admirable manner in which he tempered firmness with prudence. In 1629 he was appointed to the united sees of Kilmore and Ardagh. Both sees had been much dilapidated, and their ~~small~~ revenues afforded a scanty subsistence, but with the same disinterested zeal which had marked him through life, thinking the duties of one sufficient, he retained only Kilmore, and insisted on resigning Ardagh. He now turned his attention to the Roman Catholics, and without evincing anything of a persecuting spirit, laboured assiduously to convert them to Protestantism, and with such success as makes it almost certain that if his efforts had been duly seconded in other dioceses, Ireland would long since have been delivered from its worst evil by the complete overthrow of the

Papal ascendancy. He caused the Prayer-book to be translated into Irish, and read regularly every Sunday in the cathedral. The New Testament had already been translated, but Bedell had the honour of perfecting the boon by procuring the translation of the Old Testament. In 1641, on the breaking out of the rebellion, his house was for some time the only English one in the county of Cavan which remained uninjured; but at last he was so far involved in the common fate that he was carried off to the castle of Cloughboughter, where he was imprisoned with many others, the only exception in his favour being that he was not put in irons. He had now reached the verge of human life, and though no actual violence was done to his person, the sufferings endured by his friends, and the apparent annihilation of all which he had done for his church, weighing heavily on his spirits, he sickened and died in 1642, in his seventy-first year. The duties of the important stations which he occupied left him little time for literary labours, and his works accordingly are few and of comparatively little importance. His biography has been written by Bishop Burnet.

BEDFORD, JOHN, DUKE OF, one of the younger sons of Henry IV., king of England; famous as a statesman and a warrior. Shakspeare, who calls him *Prince John of Lancaster*, introduces him in his plays of Henry IV. as distinguishing himself by his youthful courage in the battle of Shrewsbury in 1403, and forming a kind of moral contrast to his more dissipated brother the Prince of Wales. During the reign of Henry V., he participated in the fame acquired by the conquest of France; but his talents were fully displayed when, after the death of that king, he became Regent of France, having been appointed to this post by Henry in his will. At Verneuil, in 1424, he displayed his military talents; and the difficulties which from various causes he experienced in endeavouring to maintain possession of the conquered provinces in France afforded frequent occasion for the manifestation of his ability. The greatest blemish in his character is his cruel execution of the Maid of Orleans in 1431. He survived this event about four years, and dying in 1435 at Rouen, was buried in the cathedral of that city. The duke deserves notice also for his patronage of the arts. A curious monument of his taste still exists—the Bedford Missal, a book made for him and his duchess. This rich volume is 11 inches long, 7½ broad, and 2½ thick, bound in crimson velvet, with gold clasps, on which are engraved the arms of Harley, Cavendish, and Hollis, quarterly. It is embellished with fifty-nine large miniature paintings, with more than a thousand of a small size; and among them are to be seen several portraits of persons of eminence. It was purchased by Edward Harley, earl of Oxford, from Lady Worsley, great-grand-daughter to W. Seymour, second duke of Somerset, who figured in the reign of Charles I.; and descended from Lord Oxford to his daughter, the Duchess of Portland. In the year 1786, when the collection of the duchess was brought to sale, it was purchased by a Mr. Edwards for 215 guineas, and was sold again at the sale of the collection of that gentleman, in the year 1815, when it brought £687, 15s., and came into the possession of the Duke of Marlborough. On coming to the hammer once more it attracted strongly the attention of book-collectors and antiquaries, and realized the unprecedented sum of £1100, being sold at that price (June, 1833) to Sir John Tobyn, of Liverpool. It is now lodged in the collection of the British Museum. In an historical point of view it is interesting on account of its pictorial embellishments, some of which have been engraved by Vertue for his portraits to illustrate the *History of England*.

For the antiquarian and the student of the fine arts it is one of the most interesting monuments of that age. Gough the antiquarian published a work in 1850 describing the Bedford Mosaic. Mr. Dibdin, in his *Bibliomania*, p. 253, gives an account of it.

BEDFORD, an inland county, England, capital Bedford, bounded N.W. by Northampton, W. by Bucks, S. by the latter county and Hert, E. by the latter and Cambridge, and N.E. by Huntingdon; area, 296,320 acres, of which about 250,000 are arable, meadow, and pasture. The surface is pleasingly diversified by hill and valley, and presents every variety of soil; but, on the whole, is of about an average fertility. Chalk hills, forming a portion of the Chilterns, cross it on the S.; N. of this is a belt of sand, varying from 1 mile to 5 miles in breadth, and extending from Leighton-Ruzzard, on the S.W. border of the county, to Potton, on the N.E., particularly well suited for horticultural purposes, and for the turnip husbandry. The vale of Bedford, the soil of which consists mostly of clay and loam, is very fertile; and the meadows on the margin of the Ouse and other streams are verdant and luxuriant, from frequent overflowings. The land is chiefly under tillage, and agriculture is in some districts in a very advanced state. On the sandy and chalky soils culinary vegetables are extensively cultivated for the London, Cambridge, and other markets. The onions produced here are reckoned little inferior to the Spanish; and the cucumbers, which are raised in great quantities in the open air, are much esteemed. On the clays, beans and wheat are the principal produce; on the light soils, turnips, barley, seeds, and wheat usually follow each other; on the loams, beans or pease are generally sown after wheat. Steam cultivation is becoming general. The drill is in extensive use, and much wheat is dibbled. As in other counties the area under corn crops has decreased in recent years, while that under pasture has increased. The cattle and sheep are of the highest breeds. The flocks of Leicester and Oxford Down sheep and the herds of short-horns have of late years attained great celebrity in home and foreign exhibitions. The Ouse, with an exceedingly winding course W. to E., intersects the county; besides which it is watered by the Ivel and some smaller affluents of the Ouse. Principal manufactures.—agricultural implements and straw-plait for hats, reckoned inferior only to that brought from Tuscany. The county returns two members to the House of Commons. Pop. in 1871, 146,257; in 1891, 160,704; in 1901 171,249.

BEDFORD, a parl. and municip. borough, England, co. town of Bedfordshire, 46 miles N.W. London; pleasantly situated on the banks of the Ouse, which is here crossed by a handsome stone bridge of five arches. The streets, the principal one of which is about 1½ miles long, are open, clean, and well paved. It has a complete system of sewerage and there is a perpetual water supply. A river wall has been constructed on the north side of the river below the bridge, forming a delightful promenade leading down to a tastefully laid out park-like inclosure reclaimed from what was formerly a low and swampy bed of reeds and osiers. Among the public buildings of Bedford are the law-courts (1881), a range of public schools in the late Tudor style, county hospital, assembly-rooms, subscription library, corn exchange, county jail, union workhouse, new gas-works, and a military brigade depot outside the town. There are five parish churches, and numerous other places of worship. The principal feature of the town is the Bedford Charity, founded by Sir W. Harpur in 1566, and endowed with lands in the parishes of St. John and St. Andrew, Holborn, London, and in Bedford, then of the yearly value of

£40, but which produce at the present time upwards of £13,000 per annum. To the original foundation the grammar-school erected in 1756, the modern, lower modern, and elementary schools have been added at various times, and recently new elementary schools for boys and girls, and new elementary girls' schools have been erected. In 1873 a new scheme for the management of the Harpur Trust came into operation, and provision was made for the establishment of a high school for girls, corresponding to the grammar-school, and a modern school for girls corresponding to the modern school for boys; the schools were commenced in 1880 and opened in July, 1882. Connected with the grammar-school there are two exhibitions of the annual value of £70 and £80 respectively, for four years, tenable at any university. There are also two exhibitions attached to the modern school of the annual value of £55 and £45 respectively, tenable for three years. The public schools attract large numbers of residents. The chief industrial establishments are the agricultural implement manufactory of Messrs. Howard, and the extensive engineering works of W. H. Allen & Co., founded in 1864. John Bunyan was born at Elstow, a village situated 1 mile S.W. of the town. It was at Bedford, however, that he lived, preached, and was imprisoned. There are several relics of Bunyan in the town, the principal of which are his chair in the vestry of the chapel, and his copy of Fox's Book of Martyrs, in the County Subscription Library. Bedford has railway communication with all parts of the kingdom by the Midland main line and by branch lines of the London and North Western Railway. A fine cemetery of 36 acres is laid out on the sloping hill to the N.E. of the town. About a mile S.W. the town is the Bedford County School, a handsome new building with accommodation for 300 boarders. Electric lighting is general. Bedford since 1885 sends one member to Parliament—previously two. Pop. in 1881, 19,538; in 1891, 28,023; in 1901, 35,144.

BEDFORD LEVEL, a large tract of low-lying land in England, comprising about 400,000 acres in counties Cambridge, Norfolk, Suffolk, Huntingdon, Northampton, and Lincoln, formerly full of fens and marshes, and in rainy seasons for the most part under water. Peterborough Fen, which is that part of the Level running into Northamptonshire, and extending between Peterborough and Crowland, contains between 6000 and 7000 acres. One-seventh part of the level is situated in Huntingdonshire. Nearly the whole of the Isle of Ely, which forms the N. division of Cambridgeshire, consists of this marshy ground. The S.E. part of Lincolnshire, usually termed Holland, extending to the river Witham on the N., is also included in the Bedford Level. 63,000 acres are situated in Norfolk, and 30,000 in Suffolk. It derives its name from Francis, earl of Bedford, who in the seventeenth century expended large sums of money in attempting to drain this feney district. There is sufficient evidence to show that this part of the country was formerly dry land, at a much lower level than the present surface, which is formed by sedimentary depositions. Various expedients have been had recourse to for the purpose of draining these marshes. Numerous cuts have been made, intersecting every part. Some of these are so large and deep as to serve for navigable canals. In the Isle of Ely, the Old and New Bedford rivers are two cuts, running nearly parallel to each other. These are both navigable for upwards of 20 miles. In various places wind-mills have been erected, which raise the water to the requisite height to admit of its being conveyed to receptacles sufficiently elevated by which it may be carried off to its proper channel, and steam-engines are also used for the same purpose; but the expense incurred

in draining has sometimes exceeded greatly the value of the land reclaimed. In Huntingdonshire, about the latter end of the 18th century, the tax raised on the land by the conservators for its drainage and the preserving of its embankments, was in some instances so great that the farmers preferred forfeiting their land to paying so exorbitantly for its preservation. In the present day the art of drainage is better understood than when this stupendous work was first undertaken; and the great cuts and embankments constructed in recent times have rendered the drainage now tolerably effective. In 1795 an act was passed for improving the outfall of the river Ouse, and for making a cut across the marshes from Eau Brink to Lynn; but it was not till 1818 that this important work was commenced. It was completed in about two years, and has proved highly serviceable. Another great work is the Middle Level Drain, completed in 1853 at a cost of more than £400,000. A great part of the Level is under cultivation, and produces grain and some other crops in considerable quantities; but there is still enough fen to yield many wild-fowl in winter for the London market.

BEDLAM (corrupted from Bethlehem), a London lunatic asylum, now known as the Bethlem Royal Hospital. Founded in 1246 by Simon Fitz-Mary, sheriff of London, as a priory of canons in Bishopsgate, it came to be used as a hospital for the insane. In 1547, at the dissolution of the religious houses, Henry VIII. granted it to the citizens of London, but having become insufficient and dilapidated, a new building was erected at Moorfields in 1675. This was in its turn superseded by the present structure at St. George's Fields, opened in 1815, and extended on several subsequent occasions.

BEDMAR, ALFONSO DE LA CUEVA, MARQUIS DE, cardinal, born in 1572 of one of the oldest families in Castile, was sent in 1607 by Philip III. as ambassador to Venice, and rendered himself famous by the conspiracy against Venice which St. Real has so well described. According to his account, Bedmar leagued in 1618 with Don Pedro of Toledo, governor of Milan, and the Duke of Ossuna, viceroy of Naples, to overthrow the republic and subject it to Spanish domination. The plan was to foment internal dissensions, introduce men devoted to Spain into the Venetian service, and when all was prepared to set fire to the arsenal and massacre the senate, while troops, brought partly by sea and partly from Milan by land, should force their way into the city and make themselves masters of it during the confusion. The plot was discovered, and great numbers of persons were executed. Notwithstanding the circumstantiality with which the details are given, the very existence of the conspiracy is still considered by many a very difficult historical problem. The probability is that the conspiracy was real, but that the senate, satisfied with having discovered it, and not willing to break altogether with Spain, did not think it advisable to give it much publicity. It forms the subject of Otway's tragedy, *Venice Preserved*. Bedmar was obliged to save himself by flight to avoid the fury of the populace, but he did not lose the favour either of his own sovereign or of the pope. By the former he was appointed governor of the Low Countries, where his tyranny and bigotry made him universally detested; and from the latter he received a cardinal's hat. He died at Oviedo in 1655.

BED OF JUSTICE. See *LIT DE JUSTICE*.

BEDOUINS, the name given to the nomadic Arabs, as distinguished from those settled in towns and villages and engaged in agriculture and manufactures. The Bedouins inhabit the deserts of Arabia and Northern Africa, and are lean and short, but very active and capable of enduring great fatigue.

They live mainly by hunting and pastoral occupations, and very little agriculture is carried on. Their food consists mostly of the produce of their herds, and they enjoy excellent health. Their temperament is cheerful, and they are honourable in their dealings with one another or with guests. Many of them, however, partly support themselves by robbery, but the statements regarding their marauding propensities seem to have been exaggerated. They live in tents, but frequently, when travelling, they sleep in the open air. Their religion is professedly Mohammedan, but it is of a very simple character. The women grind corn and weave coarse cloths, and many of the tribes barter horses, camels, cattle, &c., for various necessities, such as arms and cloth. Some tribes gain part of their subsistence by escorting travellers, pilgrims, &c., across the deserts. They are monogamous, but divorce is easily obtained and frequent. Though generally very ignorant, they are by no means unintelligent; and they possess the lively fancy of most Eastern nations. The head of a tribe is the *sheik*, and they have also judges known as *cadis*.

BED-SORES, a troublesome kind of sores liable to appear on persons who have been long confined to bed, and who are either unable or are forbidden to change their position. They may be greatly obviated by the use of air-cushions and water-beds.

BEDSTRAW, the name of plants of the genus *Gaium*, natural order Rubiaceae. Of the twelve or fifteen species found in Britain, one of the commonest is the yellow bedstraw or cheese-rennet (*G. verum*), a common wayside plant, the flowers and roots of which respectively afford a yellow and a red dye. Goose-grass (*G. Aparine*) is another well-known member of the genus.

BEE (*Apis*), the common name given to a large family (Apurina) of hymenopterous insects, which comprehends a great number of genera and species. There are about 250 species of bees found in Great Britain, the most important of which is, of course, the common hive or honey bee (*Apis mellifica*). The honey-bee is universally celebrated for its singular instincts, and highly prized for the valuable products of its industry. A vast number of interesting facts have consequently been collected in relation to the economy of the species, for the details of whose history a volume of considerable size would be required. We shall therefore be able to present nothing more than a sketch of the most striking generalities, obtained from the admirable works of Huber, Cuvier, &c., and to these authentic sources must refer the reader desirous of more ample information.

Three sorts of individuals are found to form a community of honey-bees: the female, mother, or, as she is commonly called, *queen*; the males or *drones*; and the working bees, improperly termed *neuters*, as they are actually females, though, in a peculiar respect, imperfect. A hive commonly consists of one mother, or queen, from 600 to 800 males, and from 15,000 to 20,000 working bees. The last-mentioned are the smallest, have twelve joints to their *antennae*, and six abdominal rings: the first joint or square portion of the posterior *tarsi* is enlarged at the posterior angle of its base, and shaped like a pointed auricle, having its internal surface covered with a fine, short, close, silky down. They are provided with stings. The mandibles are spoon-shaped, and not dentated. There is, on the outside of the hind-legs, a smooth hollow, edged with hairs, called the *basket*: the silky brush of the first joint of the posterior *tarsi* has seven or eight transverse *striae*. "The mother, or queen, has the same characteristics, but is of larger size, especially in the abdomen: she has a shorter snout or trunk, and the mandibles grooved and velvet-like

beneath the tip. The males, or drones, differ from both the preceding by having thirteen joints to the *antenna*; a rounded head, with larger eyes, elongated and united at the summit; smaller and more velvety mandibles, and shorter anterior feet, the two first of which are arched. They have no auricular dilatation nor silky brush on the square part of the posterior *tergite*, and are destitute of stings. The reproductive system has been minutely investigated, but does not seem to require any minute description.

When we examine the internal structure of this insect we find at the superior base of the trunk or sucker, below the *labrum*, a considerable aperture, shut by a small triangular piece, which has been called *tongue*, *epipharynx*, &c. This opening receives the food, which is thence conveyed by a delicate *esophagus*, through the *oesophagus*, to the anterior stomach, which contains the honey; the second stomach receives the pollen of flowers, and has on its internal surface a number of transverse and annular wrinkles. The abdominal cavity of the queen and working bees also contains the little bag of poison communicating with the sting. In the queen there are, moreover, two large ovaries, consisting of a great number of small cavities, each containing sixteen or seventeen eggs. These ovaries open near the anus, previous to which they dilate into pouches, where the egg is delayed to receive a viscous coating from an adjacent gland. The inferior half-circles, except the first and last, on the abdomens of working bees, have each on their inner surface two cavities, where the wax is formed in layers, and comes out from between the abdominal rings. Below these cavities is a particular membrane, formed of a very small hexagonally-meshed network, which is connected with the membrane lining the walls of the abdominal cavity.

Wax, of which the combs are formed, is elaborated from honey. The pollen collected from flowers, mixed with a small quantity of wax, constitutes the food of bees and their larvae; and this food appears to be modified in its composition according to the sort of individuals it is intended for. Another substance collected by bees from the opening buds of poplar and other trees, and used by them for lining their hives, stopping holes, &c., is called *propolis*.

Besides the distinctions remarked in the female, male, and working bees, Huber regards the working bees as of two sorts; one devoted to the collection of provisions, and all the materials necessary to the comb, as well as to its construction; these he calls *curvies*. The others are more delicate, small, and feeble, and employed exclusively within the hive, in feeding and taking care of the young.

The resemblance existing between the working and female bees first led to the idea that they were of the same sex, and the ingenious experiments and accurate observations of Huber enabled him to establish this fact in the most satisfactory manner. Having deprived a hive of the mother or queen, he found that the working bees immediately began to prepare a larva of their own class to occupy this important station. This was effected by enlarging the cell to the dimensions of a maternal or royal chamber, and feeding the selected individual on food exclusively destined for the nourishment of the royal larva. If merely fed upon this food, without an accompanying enlargement of the cell, the maternal faculties were but imperfectly acquired, as the female did not attain the proper size, and was incapable of laying any eggs but those which produced males.

The season of fecundation occurs about the beginning of summer, and the meeting between the females and males takes place high in the air, whence the female returns with the sexual parts of the male attached to the extremity of the abdomen. This one

fecundation is thought to be sufficient to vivify the eggs which the mother may lay in the course of two years. The laying begins immediately afterwards, and continues until autumn. Réaumur states that the female in the spring lays as many as 12,000 eggs in the lapse of twenty-four days. Each sort of egg is deposited in the appropriate cell, unless a sufficient number of cells have not been prepared in this case she places several eggs in one, and leaves to the working bees the task of subsequently arranging them. The eggs laid at the commencement of fine weather all belong to the working sort, and hatch at the end of four days. The larvae are regularly fed by the workers for six or seven days, when they are inclosed in their cell, spin a cocoon, and become nymphs, and in about twelve days acquire their perfect state. The cells are then immediately fitted up for the reception of new eggs. The eggs for producing males are laid two months later, and those for the females immediately afterwards. This succession of generations forms so many particular communities, which, when increased beyond a certain degree, leave the parent hive to found a new colony elsewhere. Three or four swarms sometimes leave a hive in a season. A good swarm is said to weigh at least six or eight pounds. The life of the bee, like that of all the other insects of its class, does not continue long after the great business of providing for the continuance of the species is completed.

The cells of the comb compose two opposite ranges of horizontal hexagons, with pyramidal bases; each layer of the comb is perpendicular, and attached by the summit, and separated from the rest by a space sufficient for the bees to pass in and out. The comb is always built from above downward. The cells, with the exception of those for the female larva and nymph, are nearly of equal size, some containing the progeny, and others the honey and pollen of flowers. Some honey cells are left open, others are closed for future use by a flat or slightly convex covering of wax. The maternal or royal cells vary from two to forty in number, are greatly superior in size, nearly cylindrical, and somewhat larger at the extremity. They have small cavities on the outside, and commonly depend from the comb like stalactites, so that the larva has its head downwards.

The history of the honey-bee, as already stated, is too extensive to allow us to attempt more than this brief sketch. But to such as have leisure, and are desirous of instructive amusement, we know of no study which promises a greater degree of satisfaction; and there is no book better adapted for this purpose than the excellent treatise of Huber, which may almost be regarded as the *re plus ultra* of its kind. Some account of the management of bees in hives is given under APIARY.

The humble-bee, of which there are about forty species belonging to Britain, belong to the genus *Bombus*. The principal species found in this country are the common humble-bee (*Bombus terrestris*), black, with the hinder part of its abdomen white; the black and red bee (*B. lapidarius*); the yellow and orange bee (*B. muscorum*), called in Scotland the *foggy* bee. In the habits of all these bees, though they accumulate a store of honey, there are circumstances which render their domestication almost impossible. The course of their life through the summer is as follows:—One bee alone having survived the rigours of winter, generally sets to work, about the early part of June, to construct a nest for herself and her progeny. These nests are of different kinds, according to the habits of the insect, some of them, as the humble-bee, going deep into the earth in dry banks, others preferring heaps of stone or gravel, and the

brown, foggy, or moss bee, choosing always some bed of dry moss, generally of the long interwoven kinds called *Hypnum*. The nest, at first constructed, is of small dimensions within; but when the bee has deposited her eggs, and the young begin to be hatched, they all labour in common, and soon produce more ample accommodations. The cells which we find in these nests are not the work of the old bee, but are formed by the young insects in the same manner as the cocoons of silkworms; and when the perfect insect is released from them by the old bee, which the latter does by gnawing off their tops, they are then employed as honey-cups. The honey which is here deposited is not, however, intended as a store for winter: it is intended solely to meet the wants of the growing colony in rearing its young bees, which are fed on a mixed food of honey and pollen dust from the flowers of plants, while they are in the caterpillar state. The wants of the young go on increasing for a great part of the summer, and the quantity of honey they consume is very large; towards the middle or latter part of September, however, the energy of the bees begins to wax fainter, and little further progress is made in adding to the colony, or in collecting honey. Cold and showery days begin, even by this time, to thin the number of the insect population. The stores of the honey-cups have not outlasted the wants of the young unfledged bees, of which they were the proper food; and if the nests be examined now, these cups are quite empty. The bees which survive the accidents of rain, cold, and frost (for they are now frequently overtaken by frosty nights in their languid journey homeward) by degrees forsake the nest and its furniture, leaving the latter as a prey to mice, beetles, or other animals. To shelter themselves for the winter they seek out some dry bank (not preferring one exposed to the sun), where they penetrate to the depth of 18 inches or 2 feet into the earth, pushing up the earth behind them, and leaving no visible track by which they have descended. Persons who have attended to the habits of wild bees can often fix on the spots where they have taken refuge, digging for and finding them with the greatest certainty. The experiment of domesticating the different kinds of wild bees has been tried, and it was found that by removing their nest cautiously in an evening, and placing it in a quiet situation in a garden or other place where they could be observed, they went on with their works without apparent alarm or interruption. At the end of the season, however, when the nest was examined, it was found empty and deserted; there were neither bees nor honey, the stronger and younger insects having, no doubt, buried themselves in the earth, and the older ones having gradually fallen victims to the accidents of approaching winter.

BEECH. The beech (*Fagus sylvatica*), one of our handiomest forest-trees, is known by its waved and somewhat oval leaves, and its triangular fruit, consisting of three cells, and inclosed, by pairs, in a husk, which is covered with simple prickles.—Beech woods, it has been observed, are peculiarly dry and pleasant to walk in, and, under their shade, afford to the botanist many interesting plants, such as the bird's-nest (*Monotropa*), winter-green (*Pyrola*), and some rare Orchideæ. Beech-trees bear lopping well, and may be trained so as to form lofty hedges, which are valuable for shelter, since the leaves, though faded, remain through the winter, and the twisted branches may be formed into a very strong fence. The wood is hard and brittle, and if exposed to the air is liable soon to decay. It is, however, peculiarly useful to cabinet-makers and turners: carpenters' planes, &c., are made of it. Split into thin layers, it has been used to make scabbards for

swords. Chairs, bedsteads, and other furniture are occasionally formed of beech. The fruit of this tree, which has the name of *beech-mast*, and falls in September, is very palatable, but if eaten in great quantity it occasions giddiness and headaches; still, however, when dried and powdered, it may be made into a wholesome bread. The inhabitants of Scio, one of the *Ægean* Islands, were once enabled to endure a memorable siege by the beech-mast which their island supplied. This fruit has occasionally been roasted, and used as a substitute for coffee. When subjected to pressure it yields a sweet and palatable oil, which is equal in quality to the best olive-oil, and has the advantage of continuing longer than that without becoming rancid. Beech-oil is manufactured in several parts of France, and is used by the lower classes of Silesia instead of butter. The cakes which remain after the oil is extracted are a wholesome food, and may be also advantageously employed for the fattening of swine, poultry, and oxen. In some countries the leaves of the beech-tree are collected in the autumn, before they have been injured by the frosts, and are used instead of feathers for beds; and mattresses formed of them are said to be preferable to those either of straw or chaff.

BEECHER, HENRY WARD, son of Lyman Beecher, a Presbyterian minister, was born at Litchfield, Connecticut, 1813, and died 1887. He was educated at Amherst College, Massachusetts; became minister at Indianapolis in 1839; accepted a call to Plymouth Congregational Church, Brooklyn, in 1847; established and edited first *The Independent* (1861), and afterwards conducted *The Christian Union* (1870); was identified with the anti-slavery, free-soil, and temperance movements; and, although still preaching in Plymouth Church, he severed his connection with the Congregationalists on the question of eternal punishment. Charged with immorality in 1876, he was acquitted by the ecclesiastical court. He was the author of numerous works, of which the best-known are *Lectures to Young Men* (1850), *Lecture-room Talks* (1870), *Lectures on Preaching* (1872-74). His biography was published by his son and son-in-law in 1888.

BEECHEY, ADMIRAL FREDERICK WILLIAM, was the son of Sir William Beechey the painter, and born in London in 1796. He entered the navy at the age of ten, and in 1811 was present in an engagement off Madagascar, in which three French frigates were captured. In 1818 he accompanied Lieutenant (afterwards Sir John) Franklin in an expedition to discover the north-west passage, and the following year took part in a similar enterprise with Captain Parry. In 1821 he was commissioned, with his brother H. W. Beechey, to examine by land the coasts of North Africa. During the years from 1825 to 1828 he was engaged as commander of the *Blossom* in another Arctic expedition, by way of the Pacific and Behring's Strait. Of this he published an account in 1831 under the title, *Narrative of a Voyage to the Pacific and Behring's Strait*, and subsequently a description of the botany and zoology of the regions visited. In 1854 Captain Beechey was raised to the rank of rear-admiral of the blue, and two years afterwards died, on Nov. 28, 1856.

BEECHEY, SIR WILLIAM, an eminent portrait-painter, born at Burford in Oxfordshire in 1753, entered a conveyancer's office, but soon abandoned it, and determined to make painting his profession. In 1772 he was admitted to the Royal Academy. A large equestrian picture of George III. secured his election as a Royal Academician, and procured him the honour of knighthood. He was afterwards constantly and lucratively employed. He died in

1599, at the advanced age of eighty-six. His attitudes and expression are generally good, but marks of carelessness are apparent in some of his latest pictures.

BEEF-EATERS, a term popularly applied to the yeomen of the guard of the sovereign of Great Britain, a body instituted in 1485. There are now one hundred in service, and seventy supernumeraries. They are dressed after the fashion of the time of Henry VII. The warders of the Tower of London, who wear a similar uniform, are also so called.

BEEF-TEA, a nourishing beverage for invalids which is prepared in a variety of ways. One way is as follows:—A pound of the lean part of beef beaten with a roller and cut into very thin slices is put into a quart of water, it is then boiled for about ten minutes, after which a few black pepper-corns are added, and some allspice-berries, and boiled for another ten minutes along with the meat. Any fat that has risen to the top is then skimmed off, and the tea is ready for use. Professor Liebig gives the following directions:—Take one pound of beef free from fat, mince it very small, add to it its own weight of water, and after digestion and agitation in the cold for about half an hour, heat it slowly to boiling. When it has boiled for a minute or two strain it through a cloth. It may be coloured with roasted onion or burned sugar, and spiced and salted to taste.

BEEF-WOOD, a popular name for the wood of several Australian trees of the genus *Casuarina*, which forms the type of a family *Casuarinaceæ*. The trees have been compared to gigantic horse-tails. They have pendent leafless branches, and apetalous monocious flowers, the male ones being in spikes, and the female in heads. The wood is of a reddish colour (whence the name), hard, and close-grained, and is used chiefly for fine ornamental work.

BEEHIVE HOUSES, the name given to ancient dwellings of small size and somewhat conical shape found in Ireland and Scotland. They are formed of long stones without cement, each course overlapping that on which it rests. Sometimes they occur singly, at other times in clusters, and occasionally they have more than one apartment. Some of them are found near ancient oratories, and were therefore probably priests' dwellings, and certain groups are encircled by a stone wall for defence. They are assigned to various dates between the seventh and the twelfth century.

BEELEZEBUB (in Hebrew, *the god of flies*), a deity of the Moabites or Syrians. This term is applied in the Scriptures to the chief of the evil spirits (see Mat. xii. 24; Mark iii. 22; &c.). The correct form is probably Beelzebub, but in the Syriac and Vulgate the final letter is *b*. The alteration in that letter from *b* to *l* may have been due to euphonic reasons, or, as has also been maintained, *sebil* may have signified *dwelling* or *dung*. We must remember what a terrible torment insects often are in the East, in order to conceive how this name came to be given to one of the greatest of the imaginary spirits of evil. We find that almost all nations who believe in evil spirits represent them as the rulers of disgusting, tormenting, or poisonous animals—flies, rats, mice, reptiles, &c. The Greeks worshipped several of their chief deities under the character of protectors against these animals; for instance, Apollo *Smintheus*, the destroyer of rats. Every one knows that Christ was charged by the Jews with driving out demons by the power of Beelzebub (Mat. xii. 24). Compare 2 Kings i. 2.

BEEER. See **ALA** and **BEEHIVING**.

BEEET (*Beta*), a genus of plants belonging to the natural order *Chenopodiaceæ*, distinguished by its

fruit being inclosed in a tough woody or spongy five-lobed enlarged calyx. The seed-vessel is bony, depressed, and contains a single seed filled with a quantity of floury albumen, in which there lies an embryo rolled up in the form of a ring. Sometimes several calyxes grow firmly together, and thus produce the appearance of a compound fruit. The fruit is what is called seed in the seed-market. Two species only are of special note, namely, the sea beet (*B. maritima*) and the common or garden beet (*B. vulgaris*). The former is a tough-rooted perennial, common on many parts of the sea-coast of Britain, where it forms a spreading, dark green bush, with narrow, oblong, shining, rather fleshy, wavy leaves, and a stem about 3 feet high, covered with distant green clustered flowers. Its leaves are an excellent substitute for spinach, on which account this plant is sometimes cultivated in gardens. The garden beet, or beet of general cultivation, differs from the last in being of only biennial duration, and in forming a tender fleshy root. It grows wild in Sicily and on the coast of Barbary, and by some botanists is looked upon as a mere variety of the sea beet. Two principal forms of it are known to cultivators, the chard beet and the common beet. In the chard beet the roots are small, white, and rather tough, and the leaves are furnished with a broad, fleshy midrib, for the sake of which the variety is grown in gardens. The leaves vary in colour, some having white ribs, others being brilliantly yellow, red, orange, and crimson. The French, who call it *poirée*, or, if white, *poirée à cardes*, employ the ribs as a vegetable, dressing them like sea-kale; they have, however, a somewhat earthy taste, and are not esteemed at English tables. Some writers regard this as a peculiar species, and call it *Beta cicla* or *hortensis*. The common beet includes all the fleshy-rooted varieties bearing the names of red beet, yellow beet, sugar beet, mangold-wurzel, &c. They differ in the size, form, colour, and proportional sweetness of the roots, but in other respects are the same, all requiring the same treatment under cultivation; for which see **MANGOLD-WURZEL**.

For garden purposes the best is the red beet of Castelnaudary, so called because it is raised chiefly in a place of that name in the s.w. of France (La Gironde); its roots are small, deep crimson, inversely conical, and almost wholly formed underground; its leaves, too, are deep purple. Other varieties of less moment are the yellow Castelnaudary, the white Silesian—very sweet, rather too large for gardens, but excellent for field culture, and much employed in the continental sugar-districts—the green-topped white, and two round-rooted sorts, called *Bassano* and the round yellow. The former is more highly esteemed than any other in Italy. All these should be sown in the month of May, in drills, where they may be set off with the hoe to 9 inches or a foot apart, according to their size. They require a deep, rich, light soil. Being a native of the Mediterranean region, the garden beet is impatient of severe cold. For this reason it requires to be taken up in the beginning of winter, and packed in dry sand, or stored in pits like potatoes, the succulent leaves having been first removed.

Red beet is principally used at table, in salad, boiled, and cut into slices, as a pickle, and sometimes stewed with onions; but if eaten in great quantity it is said to be injurious to the stomach. The beet may be taken out of the ground for use about the end of August, but it does not attain its full size and perfection till the month of October. When good it is large and of a deep red colour, and when boiled is tender, sweet, and palatable. It has been ascertained that beet-roots may be substituted for malt, if

deprived of the greater part of their juice by pressure, then dried, and treated in the same manner as the grain intended for brewing. The beer made from the beet has been found perfectly wholesome and palatable, and little inferior to that prepared from malt. A spirit of good quality has also been made from it.

From the white beet the French, during the wars with Napoleon I., succeeded in preparing sugar, that article, as British colonial produce, having been prohibited in France. Since that time, in spite of many failures, the manufacture of sugar from beet-root has always advanced with the increase of chemical and technical knowledge, and it is now an important industry in many of the continental countries, and has even been introduced into England. In this country, however, it has not as yet attained to any importance, there being, perhaps, not more than two manufactories (one at Lavenham in Suffolk, and the other in Berks) where it is carried on successfully; but since experience has shown that sugar beet can be grown in England to as great perfection as in any part of the Continent, and that sugar can be profitably extracted from it, there is no reason why this industry should not speedily establish itself here. The eastern, south-eastern, and south-midland counties of England are considered to be the most suitable for the growth of the sugar beet; but it is thought likely that the south-eastern counties of Ireland may also be found suitable. The farmer runs very little risk by experimenting as a grower of sugar beet, seeing that one ton of it is equivalent in nutritive qualities as cattle food to $1\frac{1}{2}$ tons of common mangold. The refuse pulp also possesses valuable nutritive properties, 3 tons of it being equal to 1 ton of hay, and it is much relished by cattle. The countries in which the manufacture of beet-root sugar has made most progress are France (Northern), Germany, Austria, Russia, Belgium, and Holland. The middle and south of France are too hot for the culture of the sugar beet. The immense output of beet sugar on the Continent of Europe, combined with the encouragement of the export of the manufactured article by bounties, has had a very prejudicial effect on the production of cane sugar in the British colonies and elsewhere. The beet sugar is imported into Britain partly refined, partly unrefined, mostly the latter, and together the two now amount to far more than the cane sugar imported. In 1897 the British import of unrefined beet was about 484,700 tons, of unrefined cane 243,000 tons. The average quantity of sugar obtained from the beet sorts of beet amounts to from 10 to 14 per cent. The leaves of the beet, when raised in a richly-manured soil, have been found to yield a considerable quantity of pure nitre, proceeding, in all probability, from the decomposition of the animal matter in the manure.

BEETHOVEN, LOUIS VON, born at Bonn, 17th Dec. 1770, was the son of a man who had been a tenor singer in that place. His great talent for music was early cultivated. He astonished in his eighth year all who heard him, by his execution on the violin, on which he was in the habit of performing with great diligence in a little garret. In his eleventh year he played Bach's *Wohltemperirtes Klavier*, and in his thirteenth composed some sonatas. These promising appearances of great talent induced the then reigning Elector of Cologne to send him in 1792, in the character of his organist, and at his expense, to Vienna, that he might there acquire proficiency in composition under the instruction of Haydn. Under Haydn and Albrechtsberger he made rapid progress, and became likewise a great player on the pianoforte, astonishing every one by his extempore per-

formances. In 1809 he was invited to the new court of the King of Westphalia, at which several men of distinction, and among them his pupil in music the Archduke Rodolph, subsequently Archbishop of Olmitz, persuaded him to remain by the promise of a yearly salary. He composed his principal works after 1801. From about his twenty-eighth year he suffered from difficulty of hearing, which gradually increased until he became quite deaf. He passed the closing years of his life very much retired in the village of Modlingen, near Vienna. Instrumental music has received from his compositions a new character. Beethoven united the humour of Haydn with the melancholy of Mozart, and the character of his music most resembles Cherubini's. His boldness is remarkable. Reichardt, in a comparison of Beethoven with Haydn and Mozart, says, 'The quartet of Haydn was the offspring of his amiable and original character. In naïveté and good humour he is unrivalled. The more powerful nature and richer imagination of Mozart embraced a wider field, and many of his compositions express the whole height and depth of his character. He placed more value also on exquisite finish. Beethoven, early acquainted with Mozart's compositions, gave a still broader cast to his ideas.' Besides his great symphonies and overtures, his quintette, quartette, and trios for stringed instruments, his numerous sonatas, variations, and other pieces for the pianoforte, in which he shows the great richness of his imagination, he also composed vocal music, but with less success. To this department belongs his opera *Leonore* (in its altered state called *Fidelio*), some masses, an oratorio (*Christ on the Mount of Olives*), and songs for the pianoforte, among which the composition of Matthiessen's *Adelaide*, called by the British *Rosalie*, and some songs of Goethe are celebrated. Beethoven died, near Vienna, about the end of March, 1827, after protracted sufferings.

BEE-TLE, a name applied sometimes in a wider, sometimes in a narrower, sense, to include a larger or smaller number of insects. It is often synonymous with the term *Coleoptera* (which see), while others apply it to the large tribe *Scarabæidae*, which forms the greater part of that section of insects known as *Lamellicornes*. The latter is the sense in which it is here used. The beetle tribe comprises a large number of insects, among which some are very remarkable for projections or horns growing from the head and corselet. The species found in warm climates are generally of large size and formidable appearance, though by no means noxious. They all are winged, flying with much rapidity and force; when on the ground their movements are slow and heavy. The body of the perfect insect is oval, or nearly so, and the *antennæ* are composed of eight or ten pieces inserted into a cavity under the border of the head. From the arrangement of the *antennæ*, which is peculiar to this family, its essential or distinctive character is formed. The extremities of the *antennæ* are club-shaped, and composed of plates or joints, either disposed like the leaves of a book, or arranged perpendicularly to the axis, like the teeth of a comb. The two first legs of beetles, and even the others in some instances, are dentated externally, and suited for burrowing. The *tracheæ* are all ventral.

The larvae or young are soft, flexible, whitish, semi-cylindric worms, having the body divided into twelve rings, and having a scaly head armed with strong jaws. They have nine *stigmata* or breathing holes on each side; and the feet, which are six, are scaly. The body is thicker at the posterior than at the anterior extremity, rounded, and almost uniformly curved downwards, so that the larva moves with difficulty over an even surface, and frequently

tumbles down. The period during which the larvae remain in the state of destructive worms varies in different species; those of some kinds becoming nymphs at the end of several months, and of others not sooner than in three or four years. During this period they live in the earth, where they feed upon the roots of vegetables, animal matter in a state of decomposition, &c. It is in this stage of their existence that various species prove exceedingly injurious to farmers from their great numbers and voracity. When about to undergo their change of form they make an egg-shaped cover or cocoon from fragments gnawed off wood, &c., which are stuck together by a peculiar glutinous fluid furnished by their bodies. The larvae have a cylindric stomach, surrounded by three ranges of minute *caca*, a very short, small intestine, an exceedingly large *colon*, and moderate-sized *rectum*. In the perfect insect none of these inequalities exist, as there is but one long intestine of equal size throughout. All of the beetle tribe are not destructive or injurious in their inceptive state, as many of them breed in the dung-heap, or feed upon the excrement of animals, which they serve to prepare more completely as manure. The dung-beetle, which is well known, forms a ball of dung, in the centre of which the egg is deposited, rolls it off to a distance, and buries it in the ground. Great numbers uniting in this work speedily clear away excrementitious matter, that might otherwise soon prove offensive. Among the ancient Egyptians a species of dung-beetle was held in great veneration, and Eusebius informs us that it was regarded as the animated image of the sun. We find it generally embalmed with the Egyptian mummies, placed immediately upon the root of the nose. Models of these insects have been found in the places already explored in the ancient dominion of the Pharaohs. Linnæus bestowed the name of *Scarabæus sacer* on this species, which is found in Africa and Europe (see *SCARABÆUS*). A number of beetles will be found represented in the plates at ENTOMOLOGY.

BEFANA (Ital.; from *Befania*, which signifies *Epiphany*) is a figure, generally representing an old woman, which is exhibited in Italy on the day of Epiphany by children, or in shops, &c., where things for children are sold. In Germany presents are given to children on Christmas-eve, and in France on New-year's evening, but in Italy on the day of Epiphany, and it is said that the befana brings them to good children. Generally a little bag is hung in the chimney, and next morning the children find the presents there.

BEG, now **BAY** (*prince* or *lord*), the title of certain Turkish officers or men of position, in rank between *pasha* and *effendi*. Many assume the title without having any real claim to it.

BEGA, CORNELIUS, properly *Begyn*, a famous Dutch painter and engraver, born at Harlem in 1620, was a pupil of Adrian von Ostade, and, like him, excelled in the minute perfection with which he painted the scenes of ordinary life. Two of his best paintings, a Sailor's Meeting and a Peasant Family, are in the Berlin Museum, and another, a Mixed Assemblage of Peasants, is in the Pinakothek at Munich. His engravings consist of thirty-five plates, similar in character to his pictures. He led an unsettled and licentious life, and in 1664 died of the plague, which he caught from his mistress.

BEGLERBEG, or more accurately **BEYLERBEGI** (*prince of princes*), is the title among the Turks given to the governor of certain provinces, but is not very commonly employed at the present day. The governors of Rumili, of Anatolia, and of Syria, in particular, have this title.

BEGUARDS, or **BEGHARDS**. See **BEGUINES**.

BEGUINES, **BEGHINES**, females who, without having taken the monastic vows, or bound themselves to obey the rules of an order, unite for the purpose of devotion and charity, and form societies, living together in houses called *beguinages* (which have been frequently enriched by donations), distinguishing themselves above others of the laity by their industry, their retired life, and their attention to the education of children. These societies originated towards the end of the eleventh century, in Germany and the Netherlands, and were very flourishing in the twelfth and thirteenth centuries. They still exist in considerable numbers in the Netherlands. In imitation of them males formed similar societies, under the name of *beghards*. These societies, whose names signify *suppliants* or *beggars*, underwent many persecutions from the jealousy of the clerical orders, and were sometimes confounded with the Lollards. (See **FRATERNITIES**.) There are in some places of Germany beguines, which are, however, only eleemosynary institutions, where unmarried females of the lower class of people have a lodging free of expense, and enjoy some other advantages. There are also several beguinages in Belgium.

BEHAIM, MARTIN, born at Nuremberg about 1480, is distinguished as one of the most learned mathematicians and astronomers of his age. He was engaged in commerce, and travelled for the purpose of carrying on his business, from 1455 to 1479; but he also devoted himself to the study of the mathematical and nautical sciences, in which Regiomontanus is said to have been his master. He went from Antwerp to Lisbon in 1480, where he was received with marks of distinction. He sailed in the fleet of Diego Cam on a voyage of discovery (1484-86), and explored the islands on the coast of Africa as far as the river Zaire. He is also said to have discovered, or at least to have colonized, the island of Fayal, where he remained for several years, and assisted in the discovery of the other Azores. He was afterwards knighted, and returned to his native country, where he constructed a terrestrial globe in 1492, which bears the marks of the imperfect acquaintance of that age with the true dimensions of the earth. Behaim died, after many voyages, in Lisbon, 1506. Some ancient Spanish historians assert that he made many discoveries, and that he gave to his friend Columbus the idea of another hemisphere. Robertson (in his History of America) and others contradict this statement. It is also rejected by Irving.

BEHAM.—1. **HANS SEBALD**, a celebrated painter and engraver, born at Nürnberg in 1500, studied under Albert Dürer, and was one of his ablest scholars, but rendered his talents worse than useless, both to himself and society, by employing his pencil for the most profligate purposes. The disgust produced by his licentiousness drove him from his native town to Frankfort-on-the-Main, where dissipation made his downward progress very rapid, and after contracting additional infamy by keeping a tavern of the worst description he died, or as some say, was put to death, about 1550.—2. **BARTHEL**, brother of the former, after having given proof of excellence as a painter, was sent by Duke William of Bavaria to complete his studies at Rome, and died there in 1540. There are pictures by him in several German galleries.

BEHAR, a town of India, in the Patna district of Bengal, on the Panohána. It carries on a considerable trade in cloths, rice and other grains, cotton, tobacco, &c. Silks, cottons, and fine muslins are manufactured. There are several ancient mosques, and various tombs, one of them an object of Moham-medan pilgrimage. Pop. (1891), 47,728.

BEHEADING, a capital punishment, wherein the head is severed from the body by the stroke of an axe, sword, or other cutting instrument. It is worth remarking, that in all countries where beheading and hanging are both used as capital punishments, the former is always considered less ignominious. In England the axe was the instrument generally employed. In Scotland beheading was sometimes performed by an edged instrument called the *maiden*, introduced by the Regent Morton, who was the first that suffered by it. This instrument, somewhat similar in its construction to the guillotine, has been preserved, and may still be seen at Edinburgh in the Scottish National Museum of Antiquities. In France, during the revolutionary government, beheading by means of a machine, the guillotine (which see), came into use, and still prevails there to the exclusion of all other modes of capital punishment. In the greater part of Germany, as well as elsewhere in Europe, the guillotine is also employed, or an instrument on the same principle. In China it is well known that beheading is practised, sometimes accompanied with the most studied torments. In the United States of America beheading is unknown, the halter being the only general instrument of capital punishment, although execution by electricity has been employed on a few occasions. See **CAPITAL PUNISHMENT**.

BEHEMOTH, the name of an animal most poetically and graphically described in Job xl. 15, to the end. It is evidently an herbivorous animal; but commentators and naturalists are not agreed as to the particular species. Bochart, Gesenius, and others think the description most applicable to the hippopotamus; others think it was the elephant. Nor would it militate much against this interpretation that the elephant is not a native of the country in which the scene of the poem is laid. The author of the book of Job, whether Moses or not, may have been familiar with life in Egypt and Arabia, and if so, would naturally introduce scenery and adjuncts Egyptian or Arabian, or both combined; and that the elephant was well known in Egypt is proved not only by the use of ivory in the arts, specimens of which are preserved in abundance, but also by the representation of the animal itself on early Egyptian monuments.

BEHISTUN, or **BISUTUN**, a mountain near a village of the same name, not far from Kermanshah, in Persian Kurdistan, celebrated for the sculptures and cuneiform inscriptions cut upon one of its sides—a rock rising almost perpendicularly to the height of 1700 feet. These works stand at the height of about 300 feet from the ground, and were executed by the orders of Darius I. king of Persia. The inscriptions set forth his genealogy, enumerate his nineteen victories obtained against the rebels in different provinces of his empire, and proclaim the final pacification of the latter, and his gratitude to God. The sculptures consist of a large tablet, on which are represented a king with his foot upon a prostrate man, two long-speared warriors behind him, nine captives chained together by the neck before him, and above the whole a mythological figure. The inscriptions are executed with great neatness, and the whole monument is very well preserved, the rock, which had been carefully polished, having been coated with a hard silicious varnish. The mountain was well known in ancient times, being mentioned by Diodorus under the name of Bagistanon. The same writer states also that an inscription and figures were engraved upon the rock by the orders of Semiramis, but these if they ever existed, have now disappeared. Rawlinson was the first to copy and decipher the Behistun inscriptions.

BEHN, APHERA, APRA, APHARA, or AYFARA, novelist and dramatist, was born at Wye, Kent, in 1640. Her father, being appointed Lieutenant-general of Surinam, embarked with his family for the West Indies when she was very young. The father died at sea; but his family arrived safely at Surinam, and remained there some years, during which time Aphra became acquainted with the American Prince, Oroonoko, whom she made the subject of a novel, subsequently dramatized by Southern. On her return to England she married Mr. Behn, a London merchant, but was probably a widow when selected by Charles II. to acquire intelligence on the Continent during the Dutch war. She accordingly took up her residence at Antwerp, where she engaged in gallantries to obtain intelligence; and it is said that, by means of one of her admirers, she obtained notice of the intention of the Dutch to sail up the Thames, and transmitted the news to England. This intelligence being discredited, she returned to England, and devoted herself to intrigue and writing for support; and as she had a good person and much conversational talent, she became fashionable among the men of wit and pleasure of the time. She published three volumes of poems, by Rochester, Etherege, Crisp, and others, with some poetry of her own; and wrote seventeen plays, the heartless licentiousness of which was disgraceful both to her sex and to the age which tolerated the performance of them. She was also the author of a couple of volumes of novels, and of the celebrated love-letters between a nobleman and his sister-in-law (Lord Gray and Lady Henrietta Berkeley). Pope, in his Character of Women, alludes to Mrs. Behn, under her poetical name of *Astrea*:

‘The stage how loosely does Astrea tread,
Who fairly puts her characters to bed.’

She died in 1689, and was buried in the cloisters of Westminster Abbey. An edition of her works was published in 1872.

BEIRING, or BERING, VITUS, captain in the Russian navy, was born in 1680 at Horsens, in Jutland. Being known as a skillful seaman, he was employed by Peter the Great in the navy established at Cronstadt. His talents and the undaunted courage displayed by him in the naval wars against the Swedes, procured him the honour of being chosen to command a voyage of discovery in the Sea of Kamotshka. He set out from St. Petersburg, Feb. 5, 1725, for Siberia. In the year 1728 he examined the north-eastern coasts of Asia, discovered the strait named after him, and proved that Asia is not united to America. It remained, however, to be determined whether the land opposite to Kamotshka was in reality the coast of the American continent, or merely islands lying between Asia and America. June 4, 1741, he sailed, with two ships, from Okhotsk, and touched the N.W. coast of America. Tempests and sickness prevented him from pursuing his discoveries: he was cast on a desolate island, covered with snow and ice, where he died, Dec. 18th, 1741. See next article.

BEHRING'S STRAIT, SEA, and ISLAND.—THE STRAIT is the channel that separates Asia from America, and connects the North Pacific with the Arctic Ocean. Its breadth at the narrowest part, which is between Cape Prince of Wales on the American coast and East Cape in Asia, is about 36 miles, and its depth in the middle varies from 29 to 30 fathoms. On both sides are several commodious bays; but the country is barren and rocky, with scanty vegetation. The sea here is frozen over every winter, and foggy, hazy weather is almost perpetual. Whales frequent the strait, and the walrus occurs in vast numbers. The inhabitants on

either shore support themselves chiefly by hunting and fishing; but those on the Asiatic side are greatly superior, both physically and intellectually, to those on the American. The strait is called after Vitus Behring (see preceding article), by whom it was first discovered. It was more fully explored by Captain Cook in 1778.—**BEHRING'S SEA**, sometimes called the Sea of Kamtohatka, is that portion of the North Pacific Ocean lying between the Aleutian Islands and Behring's Strait, having Alaska on the N. and Kamtohatka and the country of the Tohukhtchi on the W. The valuable fur seal is found in this sea.

—**BEHRING'S ISLAND** is in the S.W. part of the above sea, off the N. coast of Kamtohatka. It is uninhabited, and is without wood. It has, however, several springs of excellent water. Here the navigator Behring died in 1741.

BEILAN, a pass in Northern Syria to the east of the Gulf of Iskanderun, crossing the Alma-Dagh at a height of 2000 feet. A macadamized road now leads over it. The town of Beilan lies a few miles south of Alexandretta.

BEIRA, a province of Portugal, bounded chiefly by the river Douro on the N., by Spain on the E., by the Tagus and Portuguese Estremadura on the S., and by the Atlantic on the W. It was formerly divided into Beira Alta (High Beira), and Beira Baixa (Low Beira). Its extent is computed at 9248 square miles, and the pop. in 1890 was 1,450,441. The capital is Coimbra. It is traversed by the Serra d'Estréla, and well watered by the Douro, Tagus, &c. Though not fertile in grain, the produce of wine and olives is considerable. The heir-apparent of the Portuguese crown is styled Prince of Beira.

BEIRA, a rising seaport on the coast of Portuguese East Africa, at the mouth of the Pungwe river, a little to the north of Sofala. It is the nearest port to the gold-fields of Mashonaland, and a railway through Fontevilla, Chimoio, Massikessa, and New Umtali to Salisbury was completed in 1899. Beira has a good harbour protected by a sand-bank. There is a hospital, an English church, and about 1800 inhabitants, of whom about 700 are Europeans.

BEIRAM. See **BAIRAM**.

BEIRUT. See **BYRUT**.

BEIT EL-FAKIH, a town of Arabia, in Yemen, 32 miles S.E. of Hodeidah, and 77 N.E. of Mocha. It is celebrated for its trade in Mocha coffee, which is chiefly grown in the neighbourhood. Pop. 8000.—The word *Beit*, signifying a house or hut, is prefixed to the name of various other small towns and villages in Arabia.

BEITH, a town of Scotland in Ayrshire, 11 miles W. from Paisley. It stands on a small eminence, and is tolerably well built; its parish church forming a picturesque object for many miles round. Other buildings are the town-hall, public library, and several churches. The chief industries are cabinet-making and calico-printing; tanning, spinning, weaving, &c., are also carried on. Cheese is produced in considerable quantity in the vicinity. The minerals worked include coal, iron, limestone, and sandstone. Pop. in 1871, 3554; in 1901, 4963.

BEJA (anciently *Pax Julia*), a town of Portugal, in the province of Alentejo, 85 miles S.E. of Lisbon. It stands on a height, surrounded by walls flanked with forty towers, and is defended by an old fort. It was founded by the Romans, and some Roman remains are still visible. Pop. (1890), 9779.

BEJAPPOOR (anciently *Vijayapura*, the impregnable city), a town of Hindustan in the Bombay presidency, near the borders of the Nizam's Dominions, about 245 miles S.E. of Bombay, and near the right

bank of an affluent of the Krishna. From the great extent of the ruins here it would seem to have been formerly one of the largest cities of India. In its present state it may be described as two towns adjoining each other—the fort on the N., and the old town on the W. The former, though much less than the latter, has one entire and regular street 50 feet wide and nearly 8 miles long. Some of the mosques and mausoleums of Bejapoor are elaborately elegant, but the prevailing character is solid and massive. The great dome of Mahomet Shah's tomb is visible far off. The fretwork on the ceilings and verandahs, the panels covered with passages of the Koran in bas-relief, and the stone tracillies pierced with a mesh-work of Arabic characters, are all in the richest style of oriental sculpture. Among the religious structures is a Hindu temple, built in the earliest style of Brahmanical architecture. There are here some guns of enormous size; one of brass, cast in 1549, capable, it is said, of carrying an iron ball of 2845 lbs. weight! Bejapoor has become the chief town of Kalaadgi district, and some of the old palaces are now used for public purposes. Pop. (1891), 10,759.

BEJAR, a town of Spain, in the province of Salamanca, and 41 miles south of the town of that name. It is surrounded by old walls, and has considerable manufactures of cloth. Lord Hill defeated a French force here in 1813. Pop. (1897), 9857.

BEKE, **CHARLES TILSTONE**, Abyssinian explorer, was born at Stepney, in Middlesex, on Oct. 10, 1800, and educated privately. In his twentieth year he entered on a business career, and was thus led to visit Italy. On his return he studied law at Lincoln's Inn, and in 1834 he followed up several archaeological articles in periodicals by publishing *Origines Biblicæ*, or *Researches in Primeval History*. In 1837–38 he was British consul at Leipzig, and in 1840 he set out on his first journey to Abyssinia. Returning in 1843 he was awarded the gold medals of the Royal Geographical Societies of London and Paris, and again engaged in business. He subsequently made several efforts to open up commercial intercourse with Abyssinia, and in 1861–62 he travelled in Syria, Palestine, and Egypt. When the news of the detention of several British subjects by the king of Abyssinia arrived in 1864, Beke went out to secure their release, and was temporarily successful, but ultimately King Theodore had to be coerced by war. In the direction of the military operations Beke's knowledge of the country proved of the utmost value, and in 1870 he received a civil list pension of £100 per annum. In 1873 he set out for Egypt in order to explore the country traversed by the Israelites, and to locate Mount Sinai. He died, shortly after his return, on July 31, 1874. His published works comprise: *The Sources of the Nile* (1860); *The British Captives in Abyssinia* (1865); *King Theodore and Mr. Kassam* (1869); *The Idol in Horeb* (1871); *Jesus the Messiah* (1872); *Discoveries of Sinai in Arabia, and of Midian* (1878); &c. He was Ph.D. of Tübingen University.

BEKES, **BEKESVÁR**, or **BEKECH**, a market town of Hungary, capital of the county of same name, at the junction of the Black and White Koros, 41 miles S.W. of Grosswarden; formerly strongly fortified. Chief productions—flax, cattle, corn (particularly wheat), wine, and honey, in all of which the trade is considerable. Pop. in 1900, 25,482.

BEKKER, **ELIZABETH**, an ornament of Dutch literature in the department of the belles-lettres. Several of her numerous works are considered classics in Dutch literature, particularly her romances *Willem Leevend*, in eight vols.; *Letters of A. Blankart to C. Wilschut*; and the *History of Sara Burgerhart*.

She wrote her most important works in conjunction with her friend Agatha Deken, and the share of each in the composition of them is unknown. Elizabeth was born at Flushing in 1788, and died at the Hague in 1804. Her friend followed her nine days later.

BELA, the name of four kings of Hungary, belonging to the Arpad dynasty.—BELA I., son of Ladislas, competed for the crown with his brother Andrew, and at first so unsuccessfully that he was obliged to take refuge in Poland. Having there obtained assistance, he returned at the head of a powerful force, defeated his brother, who perished in the action, and mounted the throne in 1061. He immediately began a series of important reforms, and was contemplating others when he was suddenly cut off in 1063.—BELA II., surnamed the Blind, because his eyes had been put out in early life by his uncle, succeeded to the throne in 1131, and at first seemed inclined to act with moderation and justice, but the vindictive spirit of his queen involved him in quarrels with his nobles, and his own intemperate habits brought on a disease which terminated his life in 1141.—BELA III. succeeded his brother Stephen III. in 1173, and held the reins of government with a strong hand, vigorously correcting the abuses and putting down the turbulent spirit which the troubles of previous reigns had engendered. He also repelled the incursions of the Bohemians, Poles, and Austrians, and retaking the towns of which the Venetians had possessed themselves, compelled them to accept of peace in 1189. He died in 1196, and was succeeded by Emeric, one of two sons by his queen, a sister of Philip Augustus, king of France.—BELA IV. succeeded his father Andrew II. in 1235, and was shortly after obliged to collect an army to oppose the Tartars, who had invaded the country. In the battle which ensued he was signally defeated, and obliged to take refuge in Austria, where he was detained prisoner, and only recovered his liberty by the payment of a heavy ransom. The Tartars having retired in 1242 Bela regained his throne, and made it his object to repair the results of their invasion. He subsequently established his rule over Bosnia and Northern Servia, and died in 1270.

BELBEIS, or BELBEYS, a town of Egypt, 29 miles N.N.W. of Cairo, near the railway to Suez, and on the border of the desert, formerly of some importance as being on the route to the East. Pop. 7000.

BELEM, a town of Portugal, on the right bank of the Tagus, 2 miles W.S.W. of Lisbon, of which it may be considered a suburb. It contains a fine church and a monastery, the former containing the remains of Camoens and Vasco da Gama, the latter now an orphan asylum. The Torre de Belem is a remarkable square tower rising out of the Tagus.

BELFAST, the chief commercial and manufacturing city of Ireland, a seaport, municipal, parliamentary, and county borough, principal city and town in the province of Ulster, and county town of Antrim, stands on the river Lagan at the head of Belfast Lough, about 86 miles N.N.E. of Dublin. The greater part of it is built on low alluvial land on the banks of the Lagan, not more than 6 feet above high-water mark. The country around is extremely beautiful; the position of the town renders its appearance from a distance by no means imposing, but the lough itself presents a fine scene; and the slopes of the hills that bound it and partly encircle the town are thickly studded with the villas and country houses of the merchants. A scheme to bring a new water-supply from the Mourne Mountains, 40 miles south of the city, has recently been begun. The sewerage has been improved, and the town is on the whole pretty healthy. The streets are spacious, regular, and well lighted and macadamized; the

houses, mostly of brick, are well built—many of them very handsome. Tramways and the electric light have been introduced. Four bridges cross the river, one of them an elegant structure of five arches, each 50 feet span. The public buildings and institutions are in keeping with a city of its size and importance. Among the numerous churches all the chief religious bodies are represented, the Presbyterians possessing the greatest number of places of worship. Many of the churches are handsome buildings. St. Anne's, the oldest of the Episcopal (Church of Ireland) Churches, is about to be removed and the site occupied by a cathedral, of which the foundation stone was laid in 1899. Trinity, a fine specimen of pointed Gothic; and St. George's, adorned with a beautiful portico, are also deserving of notice among the Episcopal churches. The more modern of the Presbyterian churches, as well as those of other denominations, display increasing taste. St. Patrick's serves as the Roman Catholic Cathedral, but is architecturally inferior to St. Malachy's. The secular buildings include the new City Hall, in course of erection, at a cost of about £200,000, on the site of the old Linen Hall; Queen's College, a massive pile in the later Gothic style, with a façade 600 feet in length, erected at a cost of £30,000; the Presbyterian Theological College, the Methodist College, a handsome building erected in 1868 at a cost of £30,000; the municipal buildings; the county court-house; the Commercial Buildings and Exchange; the buildings for the customs and inland revenue; the post-office; the offices of the Ulster Bank, the Bank of Ireland, the Provincial Bank, the Belfast Bank, the National Bank, the Scottish Amicable, Scottish Provident, and North British and Mercantile Assurance Companies; the grand opera-house; the Theatre Royal; the county jail; the Ulster Hall; the Albert memorial clock-tower, 143 feet high; &c. Of the educational institutions the most prominent is Queen's College, first opened to students in 1849, with a president and over twenty professors and lecturers. Candidates for the ministry of the Presbyterian Church of Ireland receive a training in the General Assembly's theological college. The Methodist College and the Campbell College (a secondary school) are important institutions; while the Royal Academy and the Royal Academical Institution also deserve mention. There is a free public library belonging to the city. The charitable institutions are very numerous and important. In the city there are six extensive public parks, besides the borough cemetery. Belfast is the centre of the Irish linen trade and manufacture, having within itself the great majority of the spinning-mills and power-loom factories in Ireland, some of them of immense size and of imposing appearance. The spinning of flax and weaving of linen are indeed the staple industries of the city, and have increased at a remarkable rate in modern times. The cotton manufacture, once of importance, is now of little moment. There are two large shipyards, and in their yard and engineering works Messrs. Harland and Wolff employ some 10,000 hands, and have turned out some of the finest vessels afloat, one of their triumphs being the great steamer *Oceanic*, built for the 'White Star' line. There are also breweries, distilleries, flour-mills, oil-mills, saw-mills, foundries, printing and lithographic works, tan-yards, chemical works, aerated-water works, ropeworks, tobacco manufactories, felt manufactories, &c. The commerce of Belfast surpasses that of any other Irish seaport, and is rapidly increasing. By its customs revenue it is the fifth port in the United Kingdom. Belfast Lough, which forms the approach by sea, is a fine sheet of water between the counties of

Down and Antrim, about 14 miles in length and 6 miles in breadth at the entrance, narrowing towards the city. By dredging, a straight channel has been provided to accommodate large vessels. New docks have been constructed, giving a total harbour area of over 100 acres. One of the graving docks is 825 feet long. The most important branch of traffic by sea is across the Channel. A large fleet of steamers ply regularly between Belfast and London, Plymouth, Bristol, Liverpool, Fleetwood, Morecambe, Barrow, Whitehaven, Ardrossan, Glasgow, Dublin, Waterford, &c. There is also an extensive direct trade with British North America, the Mediterranean, France, Belgium, Holland, and the Baltic. In 1786 only 772 vessels (34,287 tons) entered the port; whereas in 1899, 11,263 vessels, with a burden of 2,539,199 tons, entered in the foreign, colonial, and coasting trades, while 11,172 vessels of 2,454,829 tons were cleared. Over 2,000,000 tons entered in the trade with Great Britain. Much of the inland trade is carried on by the Lagan Navigation, which connects the town with Lough Neagh; the Ulster Canal, connecting Lough Neagh with Enniskillen; and by three systems of railway, namely, the Great Northern, the Belfast and Northern Counties, and the County Down.—Belfast is comparatively a modern town. Up to the beginning of the seventeenth century we hear only of a castle or fortress here. In 1613 Belfast was constituted a municipal and parl. bor., with two representatives in the Irish Parliament. In 1837 it obtained the privilege of levying certain duties on goods and became a regular seaport; but its prosperity subsequently was much impeded by the civil war. Early in the eighteenth century it was described as a handsome, thriving town, but it had only 8549 inhabitants in 1767, and 18,302 in 1791. Its period of modern prosperity dates from about 1830. The municipal government consists of 15 aldermen and 45 councillors, one being Lord Mayor. The harbour is under the management of an independent board. Belfast returns four members to Parliament. The pop. in 1851 was 100,067; in 1871, 174,412; in 1881, 208,122; in 1891, 255,896; while in 1901 it was 348,965.

BELFAST, a seaport, and capital of Waldo county, Maine, United States. It is delightfully situated on West Penobscot Bay, at the mouth of a small river of the same name, and has a good harbour. Pop. (1890), 5294.

BELFORT, or **BÉFORT**, a fortified town of the first class, in France, in the department of Haut Rhin, on the Savoureuse, 47 miles north-east of Bésançon. It is well-built, and has an ancient castle situated on a lofty rock, a fine parish church, barracks, town-house, court of primary resort, public library containing 20,000 volumes, and a communal college. Manufactures—hats, clocks, wax tapers, iron-wire, sheet-iron, &c. There are also breweries, tanneries, and iron furnaces. The principal trade is in grain, wine, brandy, and liqueurs. Iron is extensively worked in the neighbourhood. In 1814 Belfort was besieged by the allies without success. In the Franco-German war it was invested by the Germans, Nov. 3, 1870, and after holding out with great bravery for more than three months, capitulated Feb. 16, 1871. In recognition of the bravery which the garrison had shown in its defence, it was allowed to march out with full military honours. This defence is commemorated by the huge Lion of Belfort in front of the citadel, the work of Bartholdi. Belfort, with the district immediately surrounding it, is the only part of the department of Haut Rhin which remained to France on the cession of Alsace to Germany, Feb. 26, 1871. Pop. (1896), 28,715.

BELGÆ, a group of German and Celtic tribes who inhabited the country extending from the Atlantic Ocean to the Rhine, and from the Maine and Seine to the southern mouth of the Rhine, which is united with the Meuse. From time to time, until the period of Cæsar, German nations pushed forward beyond the Rhine, partly expelling the Celts from their seats, partly uniting with them; and from this union sprang a mixed nation, which, in its language as well as in its manners, resembled the Germans more than the Celts. According to the testimony of Cæsar, they were the most valiant of the Gauls. Belgic tribes seem also to have settled in early Britain.

BELGARD, a town of Prussia, in Pomerania, at the junction of the Leitznitz with the Persante, with an old castle. Iron, cloth, and wood are manufactured, and there is an important horse market. Pop. (1895), 7886.

BELGAUM, a town of Hindustan, in the district of Belgaum, Bombay presidency, on the eastern slope of the Western Ghats, 2500 feet above the sea. It consists of a native town, fort, and cantonments, and is a prosperous place, with the usual courts and offices, a school for the children of natives of rank, and various other schools. In 1818 the fort and town were taken by the British, after a gallant resistance by the peishwa's forces. From the salubrity of the climate and the purity of the water, Belgaum has been selected as a permanent military station. It carries on a trade in salt, dry fish, dates, &c.; and cotton is manufactured. Pop. (1891), 40,787.

BELGIOJOSO, a town of northern Italy, in the province and 8 miles s.e. of Pavia. It is situated in a beautiful and fertile plain between the Po and the Olona, and is well built, containing a parish and an auxiliary church. The old castle, in which Francis I. was temporarily lodged after being taken prisoner at the battle of Pavia, in 1526, has been converted into a magnificent chateau, surrounded by fine gardens. Pop. 4000.

BELGIUM (French, *Belgique*; German, *Belgien*), a kingdom of Europe, bounded n. by Holland, n.w. by the North Sea, w. and s. by France, and s. by the duchy of Luxemburg, Rhenish Prussia, and Dutch Limburg; greatest length, n.w. to s.e., 185 miles; greatest breadth, n. to s., 120 miles; area, about 11,400 square miles. Belgium, in shape, resembles a triangle, which has its vertex in the west; the base resting on Germany on the east, the shorter side facing Holland and the sea, and the larger forming the frontier of France. For administrative purposes it is divided into nine provinces—Antwerp, South Brabant, East Flanders, West Flanders, Hainaut, Liège, Limburg, Luxemburg, and Namur. These provinces do not differ much in area, and are so arranged as to form a compact and commodious division of the kingdom. South Brabant, which from containing Brussels, the capital, may be considered the metropolitan province, occupies the centre, while the others cluster round, and, with the exception of the extreme provinces of Luxemburg and West Flanders, actually touch it.

The following table shows the areas of the different provinces, with their pop. on 31st Dec., 1897:—

	Area in sq. miles.	Population.
Antwerp,	1,093 ..	796,759
Brabant,	1,268 ..	1,240,739
Flanders, East, ..	1,158 ..	1,014,869
Flanders, West, ..	1,249 ..	792,397
Hainaut,	1,437 ..	1,112,440
Liège,	1,117 ..	826,792
Limburg,	981 ..	236,510
Luxemburg,	1,706 ..	218,082
Namur,	1,414 ..	548,066
	11,373	6,890,593

Physical Features.—A general idea of the surface of the country may be obtained by regarding it as an inclined plane, somewhat rugged, and considerably elevated in the s.e., from which it slopes, more or less gradually, n. and w., till it sinks into low plains, only a few feet above the level of the sea. The elevated districts are formed by ramifications of the Ardennes, which, entering Belgium from France, stretch along the s. of Namur, occupy the greater part of Luxembourg, and attain their culminating point in the s.e. of Liège at Stavelot, in the neighbourhood of Spa, where the height exceeds 2000 feet. The rocks appear to rest on primary formations; but those which reach the surface generally consist of slate, old red sandstone, and mountain limestones. Proceeding n.w., in the direction of the dip, these rocks take a cover, and the coal formation becomes fully developed. This coal-field is a continuation of that of the N. of France, and stretches through Belgium in a n.e. direction, occupying the greater part of the province of Hainaut, and a considerable part of that of Liège, and skirting the provinces of Namur and Luxembourg. It contains numerous workable seams, both of coal and iron. North and west, beyond the limits of this coal-field, a more recent formation is found, covered by deep beds of clay and sand, the former prevailing more in the interior, and the latter near the coast, where it has been drifted into hillocks or downs, and forms the only barrier against the encroachments of the sea. Some of the clay in this district is fit for the manufacture of fine pottery; but the greater part of it is fit only for coarse ware, or for bricks. In accordance with the general slope of the surface already mentioned, the main streams of Belgium have a n. direction; and the whole country lies within the basin of the German Ocean. In the s.e., where the surface is elevated and broken, numerous torrents descend with rapidity; and becoming confined within rocky, precipitous, and richly woody banks, often furnish, if not the grandest, the most picturesque and enchanting of landscapes. On reaching the lower country their speed is slackened, and their augmented volume moves along in a slow winding course. Only two of them—the Meuse and the Scheldt—have a magnitude which entitles them to the name of rivers; but so important are these two in themselves, and so numerous their affluents, that no country in Europe is better supplied with water communication. Besides the Scheldt or Schelde, and Meuse or Mass, the navigable streams are the Ambleve, Demer, Dender, Darné, Dyle, Lys, Great Nethe, Little Nethe, Ourthe, Rupel, Sambre, Yperlee, and Yezer. The climate of Belgium bears a considerable resemblance to that of the same latitudes in England. Though subject to sudden change, it is on the whole temperate and agreeable. Luxembourg and Namur, where the surface is high, and the numerous hills and dales which diversify it both cheer the animal spirits and freely circulate an air at once keen and pure, are most favourable to health and longevity. The only parts of the country which can be considered unhealthy are the low flats which prevail in Flanders, and the polders or rich alluvial tracts which have been gained from the rivers by embankment, chiefly in Antwerp. There agues and other diseases engendered by a humid and sluggish atmosphere are prevalent.

Woods and Forests.—Nearly one-fifth of the whole surface of the kingdom is occupied by wood. The distribution of it, however, is by no means equal; and hence, while the two Flanders and Antwerp fall far below the average amount, Luxembourg and Namur rise far above it, and are very densely wooded. In these provinces extensive tracts are covered with natural woods, in which the wolf and

wild bear still have their haunts. These woods are the remains of the ancient forest of Ardennes, which Cæsar describes as stretching far out into France from the banks of the Rhine. They consist of hard wood, principally oak, which is often of great size, and furnishes large quantities of the most valuable timber. By carefully dressing the stools after it is cut, a fine oak copse is raised, the cuttings of which annually produce many tons of bark, which not only supplies the tanneries of the country, but leaves a considerable surplus for exportation, chiefly to England, while the wood unfit for the carpenter is partly employed as fuel and partly converted into charcoal for the use of the iron-works, where the superiority of the iron smelted and wrought by it is well known. South Brabant also possesses several fine forests, among others that of Soignies, with which the field of Waterloo has made us familiar. In the other provinces scarcely anything deserving the name of forest is seen. Wood is distributed over them in occasional patches, and more frequently in the form of hedge-row. The timber thus grown is by no means small in aggregate amount, and forms a well-known feature in the rich rural landscapes which the old Flemish masters loved to paint; but taking into account the injury which the cultivated crops sustain from it, it is very questionable whether it ought to be regarded as a source of profit either to individual proprietors or to the country at large. The timber itself, consisting principally of various kinds of poplar, is soft and of an inferior description.

Agriculture.—The greater part of the country is well adapted for agricultural operations, and the inhabitants have so happily availed themselves of their natural advantages that they early began, and in some respects still deserve, to be regarded as the model farmers of Europe. In the high lands traversed by the Ardennes the climate is ungenial, and the soil so shallow and stony as almost to forbid the labour of the plough. Here the occupants display their skill, not so much by what they do, as by what they refrain from attempting. Instead of vain endeavours to force the growth of corn where it could never yield an adequate return, they have been contented to turn the natural pastures of the district to the best account by employing themselves chiefly in the rearing of stock. In particular they produce a hardy breed of horses, which, being admirably adapted for light cavalry, are largely exported to France for that purpose, while vast herds of swine are fed almost at no expense on the mast of the forests. At the same time no part of the surface is allowed to lie waste. Where arable land occurs it is carefully applied to its proper use. Even the vine has not been forgotten, and sunny slopes on which little else could have been grown have been made to yield a tolerable wine. In the opposite extremity of Belgium, chiefly in the province of Antwerp, and partly in that of Limburg, an extensive tract occurs which strikingly contrasts in appearance with the hilly districts of the s.e., but is perhaps still less adapted for the ordinary operations of agriculture. This tract, known by the name of Campine, is a vast expanse of moorland waste of the most dreary appearance, a dead monotonous flat composed for the most part of barren sand, in which the ordinary heaths and lichens will scarcely grow. The greater part of this tract seems destined to remain for ever in its natural state, but whenever a patch of more promising appearance occurs the hand of industry has been at work, and corn-fields and green pastures have become not unfrequent even in the Campine. Agricultural colonies, partly free and partly compulsory, have been planted in different parts of the district. The former consist of persons generally in poor circumstances who have voluntarily

engaged in reclaiming barren tracts as the means of procuring a maintenance and saving them from the degradation of pauperism. The latter consist of convicts, who, having forfeited their liberty, give compulsory labour as the penalty of their offences. By the united exertions of both a wondrous improvement has been made, and on parts of this waste some of the finest cattle of the country are reared, and much dairy produce of excellent quality is obtained. Still, however, about 800,000 acres remain untouched. With the exception of the two districts just described, there is no part of Belgium in which agriculture does not flourish; but the husbandry which has been so much lauded is seen in its greatest perfection in the two Flanders. Its excellence is owing not to any superior knowledge of what may be called the theory of agriculture, nor to any remarkable ingenuity in the invention of implements by which its operations are more efficiently or more cheaply performed, but chiefly to an innate spirit of economy and industry—an economy which carefully appropriates every gain, however small, and an industry which grudges no labour, however great, provided it is possible, by the application of it, to obtain an additional amount of valuable produce. In fact, the Flemish husbandry partakes more of the nature of garden than of field culture. In many of its operations, no doubt, horse labour is employed. The plough and the harrow are in frequent requisition, but the implement on which the greatest dependence is placed is the earliest and simplest of all—the spade. To give full scope for the use of it, the ground is parcelled out into small fields of a square form, which have their highest point in the centre, and slope gently from it in all directions towards the sides, where ditches of sufficient size carry off the superfluous water as it filters into them. To promote this filtration the ground is trenched to a uniform depth, so that the slope of the subsoil corresponds as nearly as possible to that of the surface. In performing this trenching a considerable degree of skill and ingenuity is displayed. The performance of the whole at once would be a formidable and not a very efficient process. In a few years a new subsoil would be formed, and the trenching would require to be renewed. This is rendered unnecessary in the following manner. The land is laid out in ridges about five feet wide, and when the seed is sown it is not covered as usual by the harrow, but by earth dug from the furrows to the depth of two spits, and spread evenly over the surface. By changing the ridges and throwing the furrow of the previous year into the ridge of the next, the whole ground becomes furrow in the course of five successive crops, and is consequently trenched to the depth of about 18 inches. This process of trenching never ceases, and is unquestionably one of the most important characteristics of the Flemish husbandry. The only other process particularly deserving of notice is the care and skill manifested in securing an adequate supply of manure. Every farm is fully stocked, and the cattle, instead of being grazed in the fields, are fed at home, in winter on turnips and other roots, and in summer on green crops carefully arranged, so as to come forward in regular succession, and yield a full supply of rich succulent food. In addition to this, every homestead has a tank, built and generally arched with brick, into which all the liquids of the cattle sheds are conveyed, and have their fertilizing properties increased by the dissolution of large quantities of rape-cake. This liquid manure is of singular efficacy in promoting the growth of flax, which enters regularly into the Flemish rotation, and is perhaps the most valuable crop of all, the produce of an acre being not unfre-

quently sold for £50. As this crop is one of the most exhausting which can be grown, and requires the richest manure, while it yields none, the growth of it to any great extent must, without the aid of the tank, have been impossible. At present, in Flanders alone, the value of flax annually raised has been estimated to amount to £1,500,000 sterling. About two-thirds of the whole kingdom is under cultivation, and nearly eight-ninths profitably occupied, leaving only about one-ninth waste. Of this last the far greater part belongs to the comparatively barren districts of the S. and N. E., already described; and hence, in the more favoured provinces, particularly those of South Brabant, the two Flanders, and Hainaut, the quantity of waste is so very small, that the whole surface may be regarded as one vast garden. It is an error, however, to assert, as is sometimes done, that Belgium raises more corn than it consumes. For many years the import has considerably exceeded the export. Considerable attention has been paid in Belgium to the rearing of stock, and the breeds both of cattle and horses are of a superior description. The horses of Flanders in particular are admirably adapted for draught, and an infusion of their blood has contributed not a little to form the magnificent teams of the London draymen. In general, however, Belgium stock of all kinds is inferior to that of England.

Minerals.—The mineral riches of Belgium are great, and, after agriculture, form the most important of her national interests. They are almost entirely confined to the four provinces of Hainaut, Liège, Namur, and Luxembourg, and consist of lead, manganese, calamine or zinc, iron, and coal. The lead is wrought to some extent at Vedrin, in Liège; but the quantity obtained forms only a small part of the actual consumption. Manganese, well known for its important bleaching properties, is obtained both in Liège and Namur. The principal field of calamine is at Liège, where it is worked to an extent which not only supplies the home demand, but leaves a large surplus for export. All these minerals, however, are insignificant compared with those of iron and coal. The former has its seat in the country between the Sambre and the Meuse, and also in the province of Liège. At present the largest quantity of ore is raised in that of Namur. The coal-field, already described, has an area of above 500 square miles. In 1875 the total quantity of coal raised in the kingdom was 14,869,029 tons; in 1896 it amounted to 21,252,000. The export is about 5,000,000 tons, forming one of the largest and most valuable of all the Belgian exports. Nearly the whole of the coal thus exported is taken by France. There cannot be a doubt that this export adds largely to the national wealth; but a question has been raised as to the policy of thus lavishly disposing of a raw material which is absolutely essential to the existence of a manufacturing community, and the quantity of which, though great, is by no means inexhaustible. One obvious effect of the great foreign demand is to raise the price, and thus place some of the most important manufacturing interests of the country in an unfavourable position for competing successfully with so formidable a rival as Great Britain. Besides minerals, properly so called, Belgium is abundantly supplied with building-stone, pavement, limestone, roofing-slate, and marble. Of the last, the black marble of Dinant is the most celebrated.

Manufactures.—The industrial products of Belgium are very numerous, and the superiority of many of them to those of most other countries is confessed. The fine linens of Flanders, and lace of South Brabant, are of European reputation. Scarcely less celebrated are the carpets and porcelain of Tournay,

the cloth of Verviers, the extensive foundries, machine-works, and other iron and steel establishments of Liège, Seraing, and other places. The cotton and woollen manufactures, confined chiefly to Flanders and the provinces of Antwerp, have advanced greatly. Other manufactures include silks, glass and glass-ware, hosiery, paper, beet-sugar, beer.

Trade and Commerce.—The geographical position, the admirable facilities of transport, and the indefatigable industry of the inhabitants, early combined to place Belgium at the very head of the trading countries of Europe. The gradual rise of competitors still more highly favoured has deprived her of this pre-eminence, and with the limited extent of her sea-coast it is not to be expected that she can ever take high rank as a naval state; but her trade is still of great importance, and within recent years has made a rapid advance. Her coal and iron, and the numerous products of her manufactures, furnish in themselves the materials of extensive traffic; while the possession of one of the best harbours in the world (Antwerp), situated on a magnificent river, which directly, or by canals, stretches its arms into every part of the kingdom, and now made accessible by a system of railways with every kingdom of Central Europe, naturally renders Belgium the seat of a transit trade even more important than that which it monopolized during the middle ages. This she owes chiefly to the admirable system of railway communication which, in the exercise of an enlightened policy, was early established throughout the kingdom. This system has its centre at Malines, from which a line proceeds N. to Antwerp; another W. to Ostend; another S.W. through Mons, and on to the Northern Railway of France, which communicates directly with Paris; and another S.E. to Liège, and on into Prussia, where it first communicates with the Rhine at Cologne, and thence by that river and by rail gains access both E. and S. to all the countries of Central Europe. In addition to these great trunks, one important branch connects Liège with Namur and Mons; and another from Antwerp, after crossing the W. trunk at Ghent, passes Courtray, and proceeds directly towards Lille. The ramification is thus complete; and there is not a town in Belgium of any importance which may not now, with the utmost facility, convey the products of its industry by the safest and the speediest of all means of transport. The railways have a length of about 2900 miles, three-fourths belonging to the state.

The exports of Belgian produce and manufactures, which in 1840 were to the value of £5,600,000, and in 1849 nearly £9,000,000, had risen to about £77,000,000 in 1900, the total value of exports in that year being £131,900,000. The total imports for home consumption in 1900 amounted to fully £88,682,000. The total value of the transit trade was estimated at about £110,000,000. The articles of import for home consumption include grain and flour, raw cotton, wool, hides, coffee, tobacco, chemicals, oil-seeds, yarn, timber, petroleum, &c. The exports are principally coal, yarn (chiefly linen and woollen), cereals, machinery, flax, woollens and cottons, chemicals, steel and iron, glass and glass-ware, sugar (raw and refined), zinc, manures, eggs, &c. The trade with Great Britain has grown considerably of late years; for while in 1889 the exports to Great Britain amounted to £9,891,403, and the imports of British produce from Great Britain to £4,003,536, these were in 1898 respectively £21,584,000 and £13,850,900. The chief exports to Great Britain are silks, woollen yarn, cottons, flax, glass, eggs; the chief imports cottons, woollens, raw cotton, metals, and machinery. The trade with France is even greater than with Britain. The ex-

ternal trade is chiefly carried on by means of foreign (British) vessels, and the great bulk of the shipping enters and clears from the port of Antwerp. The total burden of the Belgian mercantile marine is only about 113,000 tons, or about the same as that belonging to North and South Shields; but efforts are now being made to alter this state of matters.

People.—The Belgian population is the densest in Europe, and is composed of two distinct races—Flemish, who are of German, and Walloons, who are of French extraction. The former, by far the more numerous, have their principal locality in Flanders; but also prevail throughout Antwerp, Limburg, and part of South Brabant. The latter are found chiefly in Hainaut, Liège, Namur, and part of Luxemburg. The language of each corresponds with their origin—the Flemings speaking a Germanic dialect, and the Walloons a dialect, or rather a corruption, of French, with a considerable infusion of words and phrases from Spanish and other languages. This distinct mixture of races, and the repeated changes of masters to which they have been subjected, have necessarily been very unfavourable to the formation of a national character. Still, in some leading features there is a remarkable uniformity in the population. Though the position of the country between France and Germany has made it the battlefield of Europe, the inhabitants show few warlike tendencies, and are unwearied in pursuing the arts of peace. Hostile armies have frequently met upon their soil to decide the fate of kingdoms, carrying devastation into every quarter; but no sooner have they withdrawn than the labours of the field and the workshop have been quietly resumed, and almost all traces of devastation been in a few years effaced. The fact bears strong testimony to the patient endurance of the Belgians, but bespeaks, perhaps, a deficiency of physical and moral courage. Almost the entire population belong to the Roman Catholic Church. Protestantism is fully tolerated, and even salaried by the state, but cannot count above a mere fraction (some 10,000) of the population among its adherents. An interesting circumstance connected with this state of matters is, that Belgium early embraced, and at one time seemed on the eve of being gained to, the Reformation. Persecution of the most fearful kind took place, and did what perhaps it has never done in any other part of the world—not only forced the people back to a religion which they had given up, but induced them to return to it as willing converts. The country is divided into six dioceses, each of which possesses an ecclesiastical seminary. Monks and nuns are numerous, especially the latter (over 25,000). Education is in a very unsatisfactory state. At the census of 1890 nearly 27 per cent of the population above fifteen years of age could neither read nor write. By law each commune must have an elementary school, and the expense of primary instruction falls partly upon the communes, partly upon the state. In all the towns colleges and middle-class schools have been established, where a superior education may be obtained; while a complete course for the learned professions is provided by four universities, two of them, at Ghent and Liège respectively, established and supported by the state; one at Brussels, called the Free University, founded by voluntary association; and one at Louvain, called the Catholic University, controlled by the clergy. French is the official language of Belgium and in general use among the educated classes, and there can scarcely be said to be a national literature. Of late, however, patriotic feelings, to which the Belgians were long strangers, have acquired new strength; and one of its first manifestations has been an eager

desire to cultivate the vernacular Flemish, which differs little from Dutch. For the Flemish language and literature see NETHERLANDS. The population generally is moral, and apparently in comfortable circumstances. The far larger proportion of it is rural; and though landed property is very much subdivided, the Belgians, instead of exhibiting the wretchedness so common among the small occupiers in Ireland, manage, by a happy combination of agricultural with other industrial employments, to derive from their little holdings all the necessities and not a few of the comforts of life. It is not to be denied, however, that in some of the provinces, particularly in Flanders, population, in so far at least as it can be maintained by agricultural resources, has reached its limit, and that a deficiency of other employment, particularly spinning and hand-loom weaving, has placed large numbers on, if not within, the verge of pauperism. In Flanders and South Brabant a fourth of the people is dependent on total or occasional relief; and pauper riots have repeatedly occurred. Still the population continues to move on, as if with accelerated pace. In 1841 it was 4,067,393; in the end of 1895 it was estimated at 6,410,783.

Government.—The Belgian constitution combines monarchical with a strong infusion of the democratic principle. The executive power is vested in a hereditary king; the legislative in the king and two chambers—the senate and the chamber of representatives—the former elected for eight years, the latter for four, but one-half of the former renewable every four years, and one-half of the latter every two years. The senators are elected partly directly, partly indirectly (by the provincial councils), and must be forty years of age. Their numbers depend on population. The deputies or representatives are elected directly, one for every 40,000 inhabitants at most. All citizens of twenty-five years of age are electors, and according to certain qualifications one elector may have three votes. Each deputy is allowed 4000 francs (£160) per annum, and a free railway pass between his place of residence and the capital. The army is raised by conscription, to which every able man who has completed his 18th year is liable, and also by voluntary enlistment. The peace strength of the army in 1899 amounted to 51,270 officers and men; in time of war the total strength is about 140,000 men. Besides this standing army there is a *garde civique*, numbering about 43,000 men in time of peace, in addition to which there are 90,000 non-active men belonging to this force. The navy is confined to a few steamers and a small flotilla of gun-boats. The estimated revenue for 1898, chiefly from railways, customs, excise, and direct taxation, was £15,600,000, the estimated expenditure rather less. About one-fourth of the expenditure is in payment of the interest of the national debt, the sum total of which is fully £100,000,000. The coins, weights, and measures are the same, both in name and value, as those of France.

History.—The history of Belgium as a separate kingdom, beginning in 1830, when it was constituted an independent European state, would not truly represent the life of the people, or account even for the events of the period embraced in it. Situated between the two leading states of Europe, and deeply interested in all the political agitations resulting alike from their rivalries and their alliances, the Belgian people often changed masters. Moreover the Belgian territory contained within itself one leading element of the dissensions which raged around it. The two great races of different origin and habits, the Celtic and Teutonic, or Latin and German speaking peoples, whose different policies have divided Europe from the time of the Romans, were combined in its

population, the Walloon provinces, Hainaut, Namur, Luxemburg, being nearly allied to the French, while Flanders, Brabant, and Limburg approximated more in character and language to the Germans. Thus not only were the great rivalries of Europe represented here in miniature, but their compression within the narrow limits of what is now one of the smallest of European states, has resulted in the formation of a distinct national character. While, therefore, the chief events in which Belgium was interested prior to 1830 are matters of European history, a brief outline of them is needed here to give a distinct conception of the character of the people which they contributed to form, and fuller details of many of them will be found under other headings, as GAUL, FRANCE, AUSTRIA, SPAIN, HOLLAND, &c.

The territory anciently known as Belgium differed considerably from that which has assumed the name in modern times. According to Cæsar the territory of the Belgæ, who were one of the principal tribes of ancient Gaul, extended from the right bank of the Seine to the left bank of the Rhine, and to the ocean. This district continued under Roman sway till the decline of the empire, and subsequently formed part of the kingdom of Clovis, who subdued nearly the whole of Gaul from the Rhine to the Mediterranean. The Franks at this time did not recognize the law of primogeniture. On the death of a monarch his dominions were divided among his sons, the more ambitious of whom again strove to reunite them under their own sway. Thus the Frankish kingdoms under the descendants of Clovis were subject to continual vicissitudes, in which the Belgian territory shared, forming successively a portion of the kingdoms of Metz, Soissons, and Austrasia, until the whole was reunited under Charlemagne or Charles the Great.

This great conqueror and administrator, the first who strove to unite the states of Europe in a civilized commonwealth, was of Belgian extraction. It was at Landen and Herstal, on the confines of the forest of Ardennes, that his predecessors, the great mayors of the palace, held sway, while his own capital was established at Aix.

Charlemagne in great measure destroyed his own work by adopting the Frankish custom of dividing his kingdom among his sons at his death. This practice, which had proved so disastrous to the dynasty of Clovis, was continued for some time in his family, but was ultimately abolished in France. It long prevailed among the principalities of Germany, hindering their unity, and contributing to the ascendancy of France in Europe. Thus Belgium fell to Lothaire, the grandson of Charlemagne, forming part of the kingdom of Lotharinga, which was dependent on the German Empire; but by the treaty of Verdun (843) Artois and Flanders were united to France.

For more than a century this kingdom was contended for by the kings of France and the emperors of Germany. In 958 it was conferred by the Emperor Otto upon Bruno, archbishop of Cologne, who assumed the title of archduke, and divided it into two duchies: Upper Lorraine, containing modern Lorraine, Luxemburg, and the dioceses of Metz, Toul, Verdun, and the Palatinate; and Lower Lorraine, containing Brabant, Guelders, the bishoprics of Cologne, Liège, and Cambray. These duchies were temporarily reunited under Gonthelán I., duke of Lower Lorraine, who acquired Upper Lorraine in 1033. Among the dukes of Lower Lorraine may also be mentioned Godfrey of Bouillon, the great Crusade leader, who in 1099 was crowned King of Jerusalem.

The feudal system, which had established itself over the greater part of Europe, likewise prevailed in the Belgian territory, which in the eleventh cen-

tury was divided into duchies, counties, and marquisates, under the sway of chiefs owing allegiance to the empire, or other of the greater princes, but exercising an almost absolute dominion over their own subjects. Thus were formed the counties of Holland, Brabant, Zealand, Friesland, Namur, Hainaut; the duchies of Limburg, Guelders, Julliers, Luxembourg; the marquisate of Antwerp, and others. In the frequent struggles which took place during this period, Luxembourg, Namur, Hainaut, and Liège were usually found siding with France, while Brabant, Holland, and Flanders commonly took the side of Germany. The princes and the people, however, particularly of Flanders, were not always found on the same side.

The twelfth and thirteenth centuries were distinguished by a general uprising of the industrial communities, which had begun to grow in importance throughout Europe, against the feudal system. This movement was very strongly manifested throughout the Netherlands, less strongly perhaps in Belgium than in Holland. In both countries prosperous municipalities began to arise and assert their freedom; but the spirit of centralization, more strongly developed among the Latin-speaking races, prevailed more in the southern provinces, while the love of individual liberty, more characteristic of the German races, was more strongly manifested in the northern. Many of the towns of Flanders and Brabant, however, became extremely democratic. Ghent in particular distinguished itself for the violence and frequency of its revolts against its rulers.

From this time the popular and civic element began to count for something in political combinations. If one potentate secured the alliance of a count, another might strengthen himself by secretly encouraging insurrection in his towns. The people of Flanders often allied themselves with the English, with whom their commercial intercourse and their love of freedom gave them many common interests and feelings, and both their own counts and the French monarchy often felt the effects of this alliance.

The battle of Courtray in 1302 greatly weakened the feudal authority, but the ascendancy of the popular element led to various excesses. The organization of popular power was reserved for a later age, and the battle of Roeseleque, 1352, in which the Ghentese under Philip van Artevelde (who had offered the crown of France to Richard II. of England as the price of his assistance) were totally defeated, restored the authority of the nobles.

In 1384, Flanders and Artois fell to the house of Burgundy by the marriage of the duke, a scion of the French crown, with Margaret, daughter of Louis II., count of Nevers, the last ruler of these provinces. By a succession of happy marriages, by purchase, or by force, Holland, Zealand, Hainaut, Brabant, Limburg, Antwerp, and Namur had all by 1430 become the inheritance of the same house. In 1442 the duchy of Luxembourg was acquired, and in 1470 Guelders and Friesland. This extraordinary prosperity induced Charles the Bold, who succeeded in 1467, to attempt to unite his territories by the conquest of Alsace, Lorraine, and Liège, and raise his duchy to a kingdom. The details of this enterprise, which forms one of the most exciting episodes in European history, belong more immediately to the history of France. It ended in his defeat and death at the battle of Nancy in 1477.

His daughter Mary, who succeeded him, carried the fortunes of her house still higher, or rather she carried them into a house still more fortunate than her own, by her union with the Archduke Maximilian, son of the Emperor Frederick. Her splendid possessions had been coveted by many potentates,

and there were five candidates for her hand, among whom the most important were the dauphin, son of Louis XI., and the archduke.

It now became the part of France to excite troubles in Flanders. The policy of Maximilian, conformably to the traditions of the house of Austria, was directed to the aggrandizement of his house. He was frequently at feud with his Netherlandish subjects, whose manners he took little pains to understand, and for whose liberties he had little respect. Wars and leagues succeeded each other, which belong to the history of the great states of Europe. The Netherlands were by this union again brought under the German Empire, and especially under the house of Austria, destined soon to become the most powerful in Europe. In 1512 they were formed into a division of the empire, under the title of the circle of Burgundy. East Friesland was included in the circle of Westphalia.

On being called to the empire, Maximilian conferred the government of the Netherlands on his son Philip the Fair, under whom they began to experience the material advantages of an alliance with the house of Austria. The vast European possessions of this house opened up to its subjects the greatest facilities of the age for commercial intercourse, while the discovery of America gave them in addition the commerce of a new world. The industrial skill and enterprise of the Netherlands fitted them much more than the Spaniards, whose haughty disposition made them apt to substitute rapacity for industry, to derive permanent benefit from these opportunities. Margaret, the aunt, and Mary, the sister of Charles V., who succeeded to the government of the Low Countries, exercised it in many respects wisely and well. The former, a patroness of arts and letters, kept her court surrounded with poets, artists, and men of learning. A council of state, consisting of the governors or stadtholders of the seventeen provinces, assisted them in the administration of affairs, and such was the prosperity of the country, that more than one of the cities of the Netherlands rivalled in extent and opulence the capitals of the greatest European kingdoms.

This bright day was too soon clouded. The reign of Charles V. is less distinguished for the political struggles excited by a too prosperous ambition, which shook nearly every nation of Europe, than for the religious dissensions, and the social troubles resulting from them, which attended the dawn of the Reformation. The reformed opinions made great progress in the Netherlands; but here again a remarkable illustration was afforded of the strength of those differences of race, language, and sentiment which divided their populations. In Holland, as in Germany, the Reformation triumphed. On the Belgian territory, especially where the Walloon or French element of the population prevailed, although these opinions spread widely, they yielded at length, as in France, to the force of authority, or the sentiment of unity. In 1535 Mary published at Brussels an edict condemning all heretics to death. An insurrection excited by persecution was suppressed by Charles V. in 1540, and the Netherlands were inseparably united by the law of primogeniture with the crown of Spain. No union could have been more unfortunate. The bigotry of the Spanish branch of the Austrian family has become proverbial, and a country torn with religious dissensions could not have found itself under a worse rule.

Charles V., himself a Netherlander, born at Ghent, and still more his son Philip II. of Spain, strove to extinguish the reformed opinions among their Netherland subjects in seas of blood. Philip discarded all respect for the liberties of the Netherlands, and sub-

jected them under his governors, particularly the Duke of Alva, to all the horrors of a hostile military rule. Thousands of victims perished by every variety of execution which a barbarous cruelty could devise, hanging, beheading, burning, drowning, inferring alive; to which tortures and imprisonments were added in still greater number. During this period of desolation great numbers of artisans, abandoning their country, carried elsewhere, especially to England and Germany, which sympathized with their opinions, the arts which had enriched their own country, and which now acquired through them a wider scope, and contributed to the industrial progress of Europe.

William of Orange, the Silent, now made himself the champion of the liberties of his country. Supported chiefly by the northern states, thwarted by the jealousy of the Flemish nobles, and opposed by the Walloon provinces, which remained faithful to Spain, and even supplied her with troops, he at length succeeded in freeing the seven northern states, and forming them into the confederation of the United Provinces, whose independence, declared in 1581, was ultimately acknowledged by Spain. These events belong chiefly to the history of Holland.

Requesens, the successor of Alva, had tried too late a more humane policy. At Antwerp and Ghent the Spanish soldiers broke out into excesses. The confederates assembled in the latter town signed the pacification of Ghent, proclaiming liberty of conscience, and convoking the estates-general. The estates called in the aid of France, and offered the crown to Henry III., who declined to accept it, dreading the Catholic league in his own country. It is a special feature of the history of those days, that while the great rulers, particularly those of France and Germany, persecuted their reformed subjects, each was ready to protect the Protestant subjects of the others when opposed to their political policy. The success of the revolutionary party, consummated in the north, was at length checked in the southern provinces by the ability of Alexander Farnese, duke of Parma, the Spanish commander, and by the reactionary spirit evoked in the provinces themselves, strengthened by the emigration of many influential reformers to the northern states, and the Belgian Netherlands remained attached to Spain.

From 1596 to 1633 the Spanish Netherlands were transferred to the Austrian branch of the family by the marriage of Isabella, daughter of Philip II., with the Archduke Albert of Austria. On the death of Isabella they reverted to Spain. By the treaty of Westadt in 1714 they were again placed under the dominion of Austria. During this period they were the subject of continual intrigues, and frequently of open warfare among the European states. Twice conquered by Louis XIV., conquered again by Marlborough, coveted by Holland, Spain, Germany, France, and England, they lay continually open to the invasions and the struggles of foreign armies, and it was at this period especially that they were, as they have been called, the battlefield of Europe. Some portions of Maritime Flanders, Brabant, and Limburg, which had remained to Spain, were during this period conquered and annexed by Holland, while France acquired Artois and Walloon Flanders, the south of Hainaut, and part of Namur and Luxemburg, including the important towns of Douai, Lille, Valenciennes, Dunkirk, and many others.

From 1714 Austria was left in undisturbed possession of the remainder of the Southern Netherlands. Joseph II., styled the Philosophical Emperor, excited by his reforms a revolt, headed or stimulated by the monks of Flanders and Brabant, whom he had dispossessed of their convents. The estates of the two provinces refused to vote the imposts, and were dis-

solved. The populace took to arms. The Virgin was proclaimed generalissimo of the patriot army. The Austrian army concentrated at Turnhout was totally defeated. After applying in vain for assistance to Holland and France, neither of which could be expected to have much sympathy with their movement, the insurgents were at length subdued, and the Austrians re-entered Brussels, October, 1790.

Soon after the whole Netherlands were conquered by the revolutionary armies of France, and the country was divided into French departments, a change which, as might be expected, provoked as much resistance as the people were able to offer. When Napoleon ruled France, his brother Louis became King of Holland.

Just before the battle of Waterloo, fought on Belgian territory, had once more changed the fate of Europe, Belgium was united by the Congress of Vienna to Holland, under the title of the Kingdom of the Netherlands. This fusion had much to recommend it. The ports and colonies of the north formed a suitable complement to the arts and industry of the south. The Flemings and the Dutch spoke the same language and had the same origin; but there remained outside of this harmony the Walloon provinces, French in language and extraction. A most injudicious measure of the Dutch government, an attempt to assimilate the language of the provinces by prohibiting the use of French in the courts of justice, excited an opposition, which, encouraged by the success of the French revolution of 1830, broke out into revolt. The electoral system, moreover, gave the preponderance to the northern provinces, though inferior in population, and the interests of the provinces were diametrically opposed in matters of taxation. Belgium was agricultural and manufacturing, Holland commercial; the one wished to tax imports and exports, the other property and industry. In the chambers three different languages were spoken, Dutch, German, and French; and the members frequently did not understand each other. Nothing but the most skilful government could have overcome these difficulties, and no statesman appeared fitted to grapple with them. The revolutionary movement became general in the south, and the Dutch troops, at first successful before Brussels, were finally repulsed, and compelled by the arrival of fresh bands of insurgents from all quarters to retire. The Flemings saluted the volunteers of Liège, Mons, and Tournay by the ancient title of Belgians, and this name, which properly distinguished only a section of the people of the southern provinces, became henceforth recognized as the patriotic designation of the whole.

A convention of the great powers assembled in London, to determine on the affairs of the Netherlands, and stop the effusion of blood. It favoured the separation of the provinces, and drew up a treaty to regulate it. In the meantime the National Congress of Belgium offered the crown to the Duke of Nemours, second son of Louis Philippe, and, on his declining it, they offered it, on the recommendation of England, to Leopold, prince of Saxe-Coburg, who acceded to it under the title of Leopold I., on July 21, 1831. In November of the same year the five powers guaranteed the crown to him by the treaty of London. Some disputes with Holland in regard to the partition of territories still remained. A convention was concluded between France and England to bring these differences to a close, and in 1839 Holland acceded to a treaty, by which Belgium surrendered to her portions of Limburg and Luxemburg, which she had retained since 1830.

During the reign of Leopold, a prosperous period of thirty-four years, Belgium became a united and patriotic community. Arts and commerce flourished,

and a place was taken in the family of nations upon which the Belgian people could look with complacency. On the outbreak of the French revolution of 1848 Leopold declared his willingness to resign the crown if it was contrary to the wishes of his subjects that he should retain it. This declaration disarmed the Republican party, and confirmed the stability of the monarchy at a critical moment. During his reign Belgium concluded various treaties of commerce, with Great Britain in 1861 and 1862, and with France in 1861. Leopold II. succeeded his father in 1865. In recent years the chief feature of Belgian politics has been a keen struggle between the clerical and the liberal party. At the elections in June, 1878, the liberals gained a majority, which they lost in 1884, and failed to regain in 1890. Soon after followed a revision of the constitution, and at the elections in 1894 the clericals were returned with a great majority over liberals and socialists combined. In 1885 Leopold II. became sovereign of the Congo Free State.

BELGRADE, the capital of the Kingdom of Serbia, situated in the angle formed by the junction of the Save with the Danube, overlooked by a citadel on a rocky eminence about 160 feet high. The town has been almost entirely transformed in recent times, and now contains a number of good buildings and wide streets, being provided with the electric light, tramways, telephones, water-works, &c., and having generally the aspect of any modern European town. It contains the royal palace, residences of various ambassadors or ministers, the chief courts and government departments, archiepiscopal cathedral, Protestant church and school, high school or college, gymnasia, military school, national library of 80,000 vols., national museum, &c. The most numerous places of worship are the Greek-Catholic. There are no industries of any importance, though brewing distilling, brick-making, flour-milling, tanning, &c., are carried on to some extent. The trade, however, is active, Belgrade being the chief emporium of the kingdom, the place to which most of the imports and exports of Serbia are brought, and through which a large transit trade passes between Austria and Turkey. It is now connected by railway with Budapest and with Constantinople and Salonica, and carries on a large shipping trade by the Danube and also the Save. Under the name of Singidunum, Belgrade was the station of a Roman legion. In later times it was several times destroyed in the contests of the Ryzantines, Bulgarians, and Hungarians. In the fourteenth century it was in the possession of the Servians. Subsequently the military experiences of Belgrade have rendered it famous in history. Being the key of Hungary, it was long an object of fierce contention between the Austrians and the Turks. It was besieged by the latter in 1456, and taken by them in 1521, from which time it was held by them till 1686, when it was retaken by the Imperial army. Two years afterwards it was again captured by the Turks, who perpetrated every sort of atrocity in the conquered city, besides killing 1200 of the garrison. In 1693 the Austrians made an unsuccessful attempt to regain the town, sustaining a loss of 4000 men. From this period it remained in possession of the Turks till the year 1717, when it was besieged by Prince Eugene, with an army of 90,000 men; the Turkish garrison, amounting to 25,000 men, was supported by a strong flotilla on the Danube, and subsequently by an army of 200,000 men, under the grand vizier, who marched to the relief of the city. After a desperate conflict between the contending armies the Turks were defeated with a loss of 13,000 killed, 5000 wounded, and 8000 prisoners; the Austrians having only 8000 killed and 4500 wounded. In 1789 the Turks made another vain attempt

to retake Belgrade, but came the same year into possession of it by treaty, retaining it till 1789, when it was taken by the Austrians. It was restored by treaty to the Turks in 1791; since which time it has shared the varying fortunes of Serbia. In consequence of a quarrel with the Servians it was bombarded by the Turkish garrison in 1862. In 1867 it was evacuated by the Turks altogether, and since the treaty of Berlin (July, 1878) it has been the capital of an independent state. Pop., Dec. 31, 1883, 88,210; in 1898, 69,259.

BELIAL. By the translators of the English Bible, this word is often treated as a proper name, as in the expressions 'son of Belial,' 'man of Belial.' In the old Testament, however, it ought not to be taken as a proper name, but it should be translated 'wickedness,' or 'worthlessness.' To the later Jews Belial seems to have become what Pluto was to the Greeks, the name of the ruler of the infernal regions; and in 2 Cor. vi. 15 it seems to be used as a name of Satan, as the personification of all that is bad.

BELISARIUS, one of the greatest generals of his time, to whom the Emperor Justinian chiefly owed the splendour of his reign. Sprung from an obscure family in Thracia, Belisarius first served in the body-guard of the emperor, soon after obtained the chief command of an army of 25,000 men stationed on the Persian frontiers, and in the year 530 gained a complete victory over a Persian army of not less than 40,000 soldiers. The next year, however, he lost a battle against the same enemy, who had forced his way into Syria—the only battle which he lost during his whole career. He was recalled from the army, and soon became at home the support of his master. In the year 532 civil commotions, proceeding from two rival parties, who called themselves the *green* and the *blue*, and who caused great disorders in Constantinople, brought the life and reign of Justinian into the utmost peril, and Hypatius was already chosen emperor, when Belisarius with a small body of faithful adherents restored order. Justinian, with a view of conquering the dominions of Gelimor, king of the Vandals, sent Belisarius with an army of 15,000 men to Africa. After two victories he secured the person and treasures of the Vandal king. Gelimor was led in triumph through the streets of Constantinople, and Justinian ordered a medal to be struck, with the inscription *Belisarius gloria Romanorum*, which has descended to our times. By the dissensions existing in the royal family of the Ostrogoths (see GOTHs) in Italy, Justinian was induced to attempt to bring Italy and Rome under his sceptre. Belisarius vanquished Vitiges, king of the Goths, made him prisoner at Ravenna (540), and conducted him, together with many other Goths, to Constantinople. The war in Italy against the Goths continued; but Belisarius, not being sufficiently supplied with money and troops by the emperor, demanded his recall (548). He afterwards commanded in the war against the Bulgarians, whom he conquered in the year 559. Upon his return to Constantinople he was accused of having taken part in a conspiracy. But Justinian was convinced of his innocence, and is said to have restored to him his property and dignities, of which he had been deprived. Belisarius died in the year 565. His history has been much coloured by the poets, and particularly by Marmontel, in his otherwise admirable politico-philosophical romance. According to his narrative, the emperor caused the eyes of the hero to be struck out, and Belisarius was compelled to beg his bread in the streets of Constantinople. Other writers say that Justinian had him thrown into a prison, which is still shown under the appellation of the *Tower of Belisarius*. From this tower he

is reported to have let down a bag fastened to a rope, and to have addressed the passengers in these words:—*Dats Belisario obolum, quem virtus erezili, invidia depressit* (Give an obolus to Belisarius, whom virtue exalted, and envy has oppressed). Of this, however, no contemporary writer makes any mention. Tzetzes, a slightly-esteemed writer of the twelfth century, was the first who related this fable. Certain it is, that, through too great indulgence towards his wife Antonina, Belisarius was impelled to many acts of injustice, and that he evinced a servile submissiveness to the detestable Theodora, the wife of Justinian.

BELKNAP, JEREMY, an American clergyman and author of considerable reputation. He was born in June, 1744, graduated at Harvard College in 1762, and was ordained pastor of the church in Dover, New Hampshire, in 1767. Here he spent twenty years in the diligent performance of his clerical duties and the cultivation of literature. It was during this period that he composed his *History of New Hampshire*, a work by which he established himself as an author in the good opinion of his countrymen. In 1787 he took charge of a church in Boston, where he continued to officiate until his death, in 1798. Besides his *History* he published two volumes of his unfinished *American Biography*, and a number of political, religious, and literary tracts.

BELL. The metal from which bells are usually made is an alloy of copper and tin called bell-metal. It is commonly composed of eighty parts of copper and twenty of tin. The Indian gong, so much celebrated for the richness of its tones, contains copper and tin in this proportion. The proportion of tin in bell-metal varies, however, from one-third to one-fifth of the weight of the copper, according to the sound required, the size of the bell, and the impulse to be given. M. d'Arcet discovered that bell-metal, formed in the proportion of seventy-eight parts of copper united with twenty-two of tin, is, indeed, nearly as brittle as glass, when cast in a thin plate or gong; yet if it be heated to a cherry red, and plunged into cold water, being held between two plates of iron, that the plate may not bend, it becomes malleable. Gongs, cymbals, and tomtoms have been manufactured with this compound. The clearness and richness of the tone of a bell depend not only on the metal which is used, and the perfection of its casting, but also upon its shape; and it has been shown by a number of experiments made for this purpose, that the well-known shape with a thick lip is the best adapted to give a perfect sound. The depth of the tone of a bell increases in proportion to its size. A bell is divided into the body or barrel, the ear or cannon, and the clapper. The lip or sound bow is that part where the bell is struck.

Church-bells originated in Italy, being formed by degrees out of the cymbals, small tinkling bells and hand-bells of the East used in religious ceremonies as a means of honouring the gods or of summoning them to the feast. The feast of Osiris, particularly, is known to have been announced by bells, and in Athens the priests of Cybele made use of them at their sacrifices. Pliny says that bells were invented long before his time. They were called *tintinnabula*; and Suetonius tells us that Augustus caused one to be hung before the temple of Jupiter. Among Christians they were first employed to call together religious congregations, for which purpose runners had been employed before. Afterwards the people were assembled by the sound of little pieces of board struck together; hence called *saecred boards*. To the present day the Roman Catholics in some places use wooden clappers during part of Passion Week, begin-

ning on Holy Thursday, for the purpose of calling the faithful or rousing their attention. On Easter day he bells ring again, and the return of the accustomed sound produces a cheerful effect. Paulinus, bishop of Nola, in Campania, is said to have first introduced church-bells in the fourth century, and thence the Low Latin names of the bell, *campana* and *nola*, are said to have originated. In the sixth century bells were used in the convents; they were suspended on the roof of the church in a frame. Towards the end of this century bells were placed on some churches at the expense of certain cities. About 550 they were introduced into France. Pope Sabinian, who died in 606, first ordered that the hours of the day should be announced by striking the bell, that people might better attend to the *horæ canonicæ*, that is, to the hours for singing and praying. In 610 when Clothair besieged Sens, J Lupus, bishop of Orleans, ordered the bells of St. Stephen to be rung. The sound so frightened Clothair that he gave up the siege. In the eighth century the custom of baptizing and naming bells began. (See BAPTISM.) Church-bells were probably introduced into Britain soon after their invention. They are first mentioned by Bede, about the close of the seventh century. In the East they came into use in the ninth century; in Switzerland in 1020; at what period they were brought into Germany is uncertain. In the eleventh century the cathedral at Augsburg had two bells. The same spirit which induced people to build immense minsters, and to apply their wealth in ornamenting the places of worship, made them vie with each other in the size of their bells. The great bell of Moscow, cast in 1653, in the reign of the Empress Anne, and computed to weigh 443,772 lbs., is the largest yet made. A bell in the church of St. Ivan, in the same city, weighs 127,836 lbs.; another, 39,872 lbs.; and the one cast in 1819 weighs 112,000 lbs., the clapper alone weighing 2016 lbs. The magnificent new Church of the Sacré-Cœur, Paris, got a bell weighing 28 tons, or about 62,000 lbs., in 1895. In Vienna a bell was cast in 1711 of 39,648 lbs. In Olmutz is one of 40,096 lbs. The famous bell at Erfurt, in Germany, called 'Maria Gloriosa,' which was cast in 1497 from the metal of the former bell 'Susanna,' melted at the burning of the cathedral in 1472, weighs 30,800 lbs., is more than 24 feet in circumference, and has a clapper of 4 feet, weighing 1232 lbs. 'Great Tom', of Christ Church, Oxford, weighs 17,000 lbs.; of Lincoln, 9894 lbs.; 'Great Paul' of St. Paul's, London, cast in 1882, weighs 37,400 lbs. A bell at Nankin weighs 50,000 lbs.; and seven at Pekin 120,000 lbs. each. The practice of hanging bells in houses is comparatively a modern one, having been introduced into England since the time of Queen Anne. The inscriptions on old bells are curious, and in some cases have even historical value; and at this time, when curiosities of all kinds are eagerly sought for, collections of these inscriptions are not uncommonly brought together. The use of bells has given rise to many verses, some of which are often inscribed on the bells themselves. One of the most common old inscriptions is the following:—

'Funera plango, fulgura frango, sabbata pango;
Excito lentos, dissipio ventos, paco cruentos'.

'I bewail deaths, I break lightnings, I celebrate sabbaths, I stir the slow, I dispel winds, I pacify the bloodthirsty.' Perhaps the finest poem which has ever been written on bells is Schiller's poem, *Die Glocke* (The Bell), in which he describes the casting of the bell, and all its uses, in a highly poetical manner. This has been translated into many modern languages, and also into Greek and Latin verse. See also CHIMES and CURFEW.

Besides their use in churches, bells are employed for various purposes, the most common use being to summon attendants or domestics in private houses, hotels, &c. Bells for this purpose are of small size, and may be held in the hand and rung, but most commonly they are rung by means of wires stretched from the various apartments to the place where the bells are hung. Bells rung by electricity have now become common not only in hotels and other large establishments, but also in private houses.

Bells, as the term is used on shipboard, are the strokes of the ship's bell that proclaim the hours. Eight bells, the highest number, are rung at noon, and every fourth hour afterward, i.e. at 4, 8, 12, o'clock, and so on. The intermediate periods are indicated thus: 12:30, 1 bell; 1 o'clock, 2 bells; 1:30, 3 bells, &c., until the 8 bells announce 4 o'clock, when the series recommences. The even numbers of strokes thus always announce hours, the odd numbers half-hours.

BELL, ANDREW, D.D., the author of the mutual instruction or 'Madras' system of education, was born at St. Andrews on March 27th, 1753. He was the son of a barber, and was educated at the university of his native town. He resided for seven years in Virginia, and on returning took orders in the Church of England. In 1787 he went to India, where he became chaplain at Fort St. George, Madras, and manager of the institution for the education of the orphan children of European soldiers. In that year the directors of the East India Company sent out orders to Madras that a seminary should be established there for the education and maintenance of the orphans and distressed male children of the European military. The superintendence of this asylum was undertaken by Dr. Bell, who, having no object in view but the gratification of his benevolence, refused the salary of 1200 pagodas (£480) which was attached to it. Failing to retain the services of properly qualified ushers, he resorted to the expedient of conducting his school through the medium of the scholars themselves. It was in the mode of conducting a school by means of mutual instruction that the new method of Dr. Bell consisted; and its value as an abbreviation of the mechanical part of teaching, and where large numbers were to be taught economically, could not be easily overestimated at the time. His system, however, is now abandoned. From the commencement of his experiment he made the scholars, as far as possible, do everything for themselves; they ruled their own paper, made their own pens, &c., while the teacher only directed them. The maxim of the school was that no boy could do anything right the first time, but he must learn when he first set about it, by means of his teacher, so as to be able to do it himself ever afterwards. After superintending the school for seven years he found it necessary for his health to return to Europe. On his arrival he published in 1797 a pamphlet, entitled, *An Experiment in Education made at the Male Asylum of Madras*, in which he gave an account of his system. The first place in England where the system was adopted was the charity school of St. Botolph's, Aldgate, and gradually, especially through the influence of Joseph Lancaster, it was very widely carried out in England and indeed in almost every other civilized country. Dr. Bell acquired in later life the dignity of a prebendary of Westminster, and was master of Sherborn Hospital, Durham. He employed himself during his latter years in writing several works on education, among which the most valuable were, *The Elements of Tuition*, *The English School*, and *Brief Manual of Mutual Instruction and Discipline*. The closing period of his life was passed at Cheltenham, where he died Jan. 27, 1832. Before

his death he gave over to trustees £120,000 three per cent stock for education, half of it for the purpose of founding an academy in his native city. There is a life of Bell by Southey (3 vols., 1844).

BELL, SIR CHARLES, anatomist, the son of an Episcopal clergyman, the Rev. William Bell, was born at Edinburgh in November, 1774, studied anatomy there under the superintendence of his brother John (see below), and had scarcely reached manhood before he had proved himself to be a first-rate anatomist as well as an excellent lecturer. In 1804, being already known by his published works, he went to London, and worked his way slowly but surely, at a time when he had to compete with a number of the ablest and most original-minded men whom his profession has produced. In 1811 he published an essay entitled *A New Idea of the Anatomy of the Brain*, containing the important discovery of the distinction between sensory and motor nerves, on which his fame chiefly rests. This discovery was elaborated later in papers read before the Royal Society. It at once attracted general attention, established his reputation, and was doubtless the main ground on which, on the accession of William IV., he was selected for the honour of knighthood. In 1812 he was appointed surgeon to the Midlesex Hospital, to whose prosperity he afterwards greatly contributed. In 1824 he accepted the chair of anatomy and surgery to the London College of Surgeons, and in 1836 that of surgery in the University of Edinburgh. This latter situation he had accepted in the hope of spending his latter years among his early friends, and at the same time enjoying abundant leisure for the prosecution of his favourite pursuits. In 1842 he set out for London, but had only reached the seat of his friend, Mr. Holland, of Hallow Park, near Worcester, when he was cut off by *angina pectoris* on April 28th. His principal works are *Anatomy of Expression* (1806); *System of Operative Surgery; Anatomy and Physiology*, partly the work of his brother John; *Animal Mechanics*, written for the Society for the Diffusion of Useful Knowledge (1828); *Nervous System* (1830); and the *Bridgewater Treatise on the Hand* (1833). There is a life in French by Pichot (1859), and in 1870 a selection from Sir Charles Bell's correspondence was published.

BELL, GEORGE JOSEPH, brother of Sir Charles and John Bell (see both names), an eminent lawyer, was born in Edinburgh on March 26th, 1770, passed as advocate in 1791, and though he never rose high in practice, soon distinguished himself, and became one of the first authorities on the subject of mercantile jurisprudence and the law of bankruptcy. This distinction he earned for himself by the publication of a work which first appeared in 1804, in two vols. 8vo, under the title of a *Treatise on the Laws of Bankruptcy*, but in subsequent editions was extended to two large vols. 4to, and changed its name to *Commentaries on the Laws of Scotland and on the Principles of Mercantile Jurisprudence*. This work notwithstanding recent changes in the law, is still a standard. In 1822 Mr. Bell was appointed to the chair of Scots law in the University of Edinburgh, and in 1831 obtained the more lucrative office of a principal clerk of session. He died in 1843. Besides the work above-mentioned, he published *Principles of the Law of Scotland*, the tenth edition of which was issued in 1897; and other works.

BELL, HENRY, the first successful applier of steam to the purposes of navigation in Europe, was born at Torphichen, in Linlithgowshire, April 7, 1767. In 1787 he engaged with Mr. James Inglis engineer at Bell's Hill, with the view of completing his knowledge of mechanics. He afterwards went

to London, but about the year 1790 he returned to Scotland, and practised for several years, at Glasgow, the craft of a house-carpenter. In 1808 he removed to Helensburgh, where he continued to prosecute his favourite task of mechanical scheming, without much regard to the ordinary affairs of the world, though he became proprietor of baths there. The application of steam to navigation had been already attempted by Mr. Miller of Dalawinton (among others), who, in 1788, had a vessel constructed, which was propelled by a small engine and paddle-wheel, the scene of operations being a loch on his own property in Dumfriesshire. Some further experiments were made by this gentleman and others, and although they did not fail to establish the practicability of steam navigation (see the article *STEAM NAVIGATION*), yet the scheme had no practical result for several years. Henry Bell seems to have turned his attention to the subject before the end of the century, and at last, in January, 1812, produced the *Comet*, a vessel of 40 feet in length, which was found in a great measure to answer the purpose contemplated. This vessel could make way against a head tide in the river at the rate of 5 miles an hour, and continued to ply on the Clyde for a number of years. It may be mentioned, that Mr. Robert Fulton, an American engineer, had launched a boat upon this principle in 1807, and that it performed long voyages upon the Hudson River; but it has been proved that Fulton had derived assistance in the construction of his vessel from Bell, who must therefore be allowed the praise of having done, in his own country, what all other men, notwithstanding the superior advantages of skill and capital, had failed in doing. Bell lived to see the bosom of the Clyde dotted far and wide by innumerable copies of his own invention; he lived to know that steam-boats promised to give a new turn to the art of general warfare; he lived to behold numerous secluded parts of his own country subjected by means of these light wanderers of the deep to the blessings of commerce and civilization, which could not have otherwise reached them for centuries; yet he reaped for himself little advantage. While mankind at large were enjoying the blessings which he had pointed out to them, he approached the confines of old age with the prospect of hardly the average comforts which attend that stage of existence in the humbler walks of society. Touched by his condition, a number of benevolent individuals instituted a subscription in his behalf, and it is creditable to the good feeling of the citizens of Glasgow and other places that a considerable sum was raised. The trustees on the river Clyde also gave Mr. Bell an annuity of £100, which he enjoyed for several years, the half of which sum was continued to his widow. Bell died at Helensburgh on the 14th Nov., 1830. A monument was erected to his memory at Duglass Point on the Clyde.

BELL, JAMES, an eminent geographical writer, was born at Jedburgh, 1769, and removed with his father to Glasgow in 1777, where, after receiving a liberal education, he served an apprenticeship to the weaving business, and in 1790 commenced the manufacturing of cotton goods upon a large and respectable scale. In the universal depression occasioned by the shock of the French revolution in 1793, Mr. Bell lost his all, and was reduced to the condition of a common warper; but having relinquished that line of life, he was about the year 1815 engaged to improve the Glasgow System of Geography, an original work in two vols., which had met with considerable encouragement, and was now, chiefly by the labours of Mr. Bell, extended to five vols. It was well received by the public, and formed the basis of his principal work, *A System of Popular and Scientific*

Geography, published at Glasgow in six vols. His *Gazetteer of England and Wales* was in the course of publication at the time of his death. He died in 1833.

BELL, JOHN, of Antermomy, in Scotland, was born on his paternal estate in 1691, and after receiving a classical education, turned his attention to the study of medicine. Having gone to St. Petersburg in 1714, after the completion of his studies, he happened to be in that city when an embassy was being sent to the Sophy of Persia, and was appointed medical attendant to the ambassador. On his return from Persia to the Russian capital in 1718 he found there was another embassy preparing to set out for China, and through the influence of the ambassador whom he had attended to Persia he obtained an appointment in it also. The embassy arrived at Pekin 'after a tedious journey of exactly sixteen months.' Mr. Bell has left a very full account of occurrences during his residence in the capital of China. The embassy left that city on the 2d of March, 1721, and arrived at Moscow on the 5th of Jan., 1722. The war between Russia and Sweden was now concluded, and the czar had determined to undertake an expedition into Persia, at the request of the sophy, to assist that prince against the Afghans, his subjects, who had seized upon Kandahar and possessed themselves of several provinces on the frontiers towards India. Mr. Bell's former journey to Persia gave him peculiar advantages, and he was accordingly engaged to accompany the army to Derbend, from which he returned in December, 1722. Soon afterwards he revisited his native country, and returned to St. Petersburg in 1734. In 1737 he was sent to Constantinople by the Russian chancellor, and Mr. Roudou, the British minister at the Russian court. He seems now to have abandoned the public service, and to have settled at Constantinople as a merchant. About 1746 he married Mary Peters, a Russian lady, and determined to return to Scotland. He spent the latter part of his life on his estate, where he died on the 1st of July, 1780. The only work written by Mr. Bell is his *Travels from St. Petersburg in Russia to Various Parts of Asia*.

BELL, JOHN, a distinguished surgeon in Edinburgh, was born in that city in 1763. After completing his professional education he travelled for a short time in Russia and the N. of Europe; and on his return began to deliver lectures on surgery and midwifery. These lectures, which he delivered between the years 1786 and 1796, were very highly esteemed, and speedily brought him into practice as a consulting and operating surgeon. The increase of his private practice, indeed, rendered it necessary for him in 1796 to discontinue his lectures, and from that time forward he devoted himself to his patients, and to the preparation of the several publications of which he was the author.

For upwards of twenty years Mr. Bell may be said to have stood at the head of his profession in Edinburgh as an operator. Patients came to him from all quarters, both of Scotland and England, and even from the Continent; and during that interval he performed some of the most delicate and difficult operations in surgery. Early in 1816 he was thrown by a spirited horse, and appears never to have entirely recovered from the effects of the accident. In the autumn of that year he made an excursion, partly on account of his health, to London; thence he proceeded to Paris, and afterwards pursued his journey southwards, visiting the most distinguished cities of Italy. During his residence on the Continent he was treated in the most flattering manner by the members of his own profession; and

his countrymen, who after the peace of 1815 had gone to the Continent in great numbers, gladly took his professional assistance. In Paris, Naples, and Rome in particular, his numerous patients occupied him perhaps too exclusively: for his health continued to decline, and he died at Rome, April 15, 1820, in the fifty-seventh year of his age.

The following is a complete list of his professional works.—(1) *The Anatomy of the Human Body* (three vols., 1793 to 1802; third edition, with plates by Charles Bell, three vols. 8vo, 1811). (2) Engravings of the Bones, Muscles, and Joints, illustrating the first volume of the *Anatomy of the Human Body*, drawn and engraved by himself (royal 4to, 1794, third edition). (3) Engravings of the Arteries, illustrating the second volume of the *Anatomy of the Human Body* (royal 4to, 1801; third edition, 8vo, 1810). (4) *Discourses on the Nature and Cure of Wounds* (8vo, 1795; third edition, 1812). (5) Answer for the Junior Members of the Royal College of Surgeons to the Memorial of Dr. James Gregory to the Managers of the Royal Infirmary (8vo, 1800). (6) *The Principles of Surgery* (three vols. 4to, 1801-8). (7) *Letters on Professional Character, &c.* (8vo, 1800). (8) *Observations on Italy* is a posthumous work, which was edited by the late Bishop Sandford of Edinburgh.

BELLA, STEFANO DELLA, an engraver, born at Florence in 1610. He followed at first Callot's manner, but soon adopted one of his own. In 1642 he went to Paris, where he was employed by Cardinal Richelieu. He returned to Florence, and became the teacher in drawing of Cosmo, the son of the great duke, and died in 1664. It is said that he engraved 1400 plates.

BELLADONNA. See NIGHTSHADE.

BELLAMY, JACOBUS, a Flemish poet, was born at Flushing in the year 1757, and died in 1786. He was twenty-five years old, and followed the trade of a baker, when, in the year 1772, the second secular festival in commemoration of the foundation of the republic was celebrated throughout Holland. His genius, suddenly inflamed by the love of his native land, rendered him a poet, and his first productions met with success. He studied Latin, made himself better acquainted with his mother tongue, and composed several pieces of merit sufficient to induce the Society of Arts at the Hague to incorporate them in their collections. In 1785 he published his patriotic songs under the title *Vaderlandse Gezangen*, which secure him a place among the first poets of his nation. Bellamy sung likewise the praise of love. The later works of this poet betray a certain melancholy, which renders them still more interesting. A biographical account of him has been written by G. Kniper. He may be placed by the side of Bilderdijk, Helmers, Loois, R. Feyth, &c., as one of the restorers of modern Dutch poetry.

BELLARMINO, ROBERTO, a cardinal and celebrated controversialist of the Roman Church, was born at Monte Pulciano in Tuscany in 1542. At the age of eighteen he entered into the College of Jesuits, where he soon distinguished himself; and his reputation caused him to be sent into the Low Countries to oppose the progress of the reformers. He was ordained a priest in 1569 by Jansenius, bishop of Ghent, and placed in the theological chair of the University of Louvain. After a residence of seven years he returned to Italy, and was sent by Sixtus V. to France, as companion to the legate. He was made a cardinal on account of his learning, by Clement VIII., and in 1602 created Archbishop of Capua. At the elections of Leo XI. and Paul V. he was thought of for the pontificate, and might have been chosen had he not been a Jesuit. Paul

V. recalled him to Rome, on which he resigned his archbishopric without retaining any pension on it as he might have done. In 1618 he left his apartments in the Vatican, and returned to a house of his order, where he died in 1621. So impressed were the people with the idea of his sanctity that it was necessary to place guards to keep off the crowd which pressed round to touch his body or procure some relics of his garments. Bellarmine had the double merit with the court of Rome of supporting her temporal power and spiritual supremacy to the utmost, and of strenuously opposing the reformers. The talent he displayed in the latter controversy called forth all the similar ability on the Protestant side; and for a number of years no eminent divine among the reformers failed to make his arguments a particular subject of refutation. The great work which he composed in this warfare is entitled *A Body of Controversy*, written in Latin, the style of which is perspicuous and precise, without any pretension to purity or elegance. He displays a vast amount of Scriptural learning, and is deeply versed in the doctrine and practice of the church in all ages, as becomes one who determines every point by authority. To his credit he exhibits none of the lax morality of his order, and in respect to the doctrines of predestination and efficacious grace, is more a follower of St. Augustine than a Jesuit. His maxims on the right of pontiffs to depose princes caused his work on the temporal power of the popes to be condemned at Paris. On the other hand, it did not satisfy the court of Rome, because it asserted, not a direct, but an indirect, power in the popes in temporal matters, which reservation so offended Sixtus V., that he placed it among the list of prohibited books. His society thought so highly of his sanctity, that proofs were collected to entitle him to canonization; but the fear of giving offence to the sovereigns whose rights he opposed has always prevented a compliance with the ardent wishes of the Jesuits. His controversial works were published at Prague in 1721, and again at Mayence in 1842. Of his other works the most important is his *Christianæ Doctrinæ Applicatio* (Rome, 1603)—a work originally composed in Italian, but since translated into all European languages. Bellarmine—as he is called by English writers—also left an autobiography, which was reissued and annotated by Dollinger and Reusch (1887).

BELLARY, a town in India, in the presidency of Madras, capital of a district of the same name, 280 miles north-west of Madras. It is the head-quarters of the troops belonging to the districts of Bellary and Kadapah, and possesses two forts, one built on the summit, and the other on a lower eminence of a huge granite rock about two miles in circumference, and rising to the height of about 450 feet from the ground. Bellary is the terminus of a branch line of the Madras railway. The cantonment possesses an excellent bazaar. Pop. (1891), 59,770.—The district of Bellary lies in the angle between Mysor and Hyderabad, to both of which it has belonged in turn. It was ceded by the former to the latter in 1792, and by the latter to the British in 1800. Area, 5975 square miles; pop. (1891), 900,126.

BELLE-ALLIANCE. See WATERLOO.

BELLEGARDE, GABRIEL DU PAO DE, French writer, born in 1717, died in 1789. He was an indefatigable compiler, was an adherent of the Port-Royal school, and published an edition of the works of Antoine Arnauld.

BELLE-ISLE, or BELLE-ISLE-EN-MER (anciently *Indulis*), an island in the Bay of Biscay, belonging to France, in the department of Morbihan, about 8 miles south of Quiberon Point, about 11 miles long, and 6 broad where broadest, surrounded by rocks. The

soil is diverse, consisting of rock, salt marsh, and fertile grounds. Palais is the capital. Pop. 10,000.

BELLE-ISLE, or **BELLISLE**, an island, 15 miles \times of Newfoundland and π . π . of the Gulf of St. Lawrence, about 21 miles in circuit. On the π . π . side it has a small harbour, called Lark Harbour, within a little island close to the shore. At the π . point it has another small harbour or cove that will only admit fishing shallops. A rescue station has been established for persons that may be shipwrecked. The narrow channel between Newfoundland and the coast of Labrador is called the Straits of Belle-isle. Steamers from Glasgow and Liverpool to Quebec round the north of Ireland commonly go by this channel in summer as being the shortest route.

BELLEISLE, **CHARLES LOUIS AUGUSTE FOUQUET**, COMTE DE, Marshal of France, born at Villefranche, Sept. 22, 1684, distinguished himself during the famous siege of Lille, and became brigadier in the royal forces. After the conclusion of the war of the Spanish succession he went with Marshal Villars to Rastadt, where he displayed diplomatic talents. The cession of Lorraine to France in 1735 was principally his work. Cardinal Fleury reposed confidence in him; Louis XV. made him Governor of Metz and the three bishoprics of Lorraine, which office he held until his death. Before the breaking out of the war in 1741 he visited the principal courts of Germany with the design of disposing them, after the death of Charles VI., to choose the Elector of Bavaria Emperor of Germany; and he displayed so much address on this occasion as to excite the admiration of Frederick II. After his return he placed himself at the head of the French forces sent to oppose those of Maria Theresa. He took Prague by assault; but the King of Prussia having made a separate peace, he was compelled to a retreat, which he performed with admirable skill. In Dec. 1744, when on a diplomatic journey to Berlin, he was arrested in Germany and sent to England, but he was exchanged in 1746. In the following year he forced General Browne, who had entered the π . of France from Italy, to raise the siege of Antibes and to retreat over the Var. In 1748 the king made him a duke and peer of France, and the department of war was committed to his charge. He reformed the army by abolishing many abuses, enlarged the military academy, and caused an order of merit to be established. He died at Versailles on Jan. 26th, 1761.

BELLENDEN, **JOHN**. See **BALLETYNNE**.

BELLENDEN, **WILLIAM**, a Scottish writer of the seventeenth century, distinguished for the elegance of his Latin style. He was born about 1555, probably at Lasswade, Midlothian, and educated at Paris, where he was professor of belles-lettres in 1602; and though he was made master of requests by James I., he still continued to reside in the French metropolis. In 1608 he published a work entitled *Ciceronis Princeps*, containing a selection from the works of Cicero, consisting of passages relating to the duties of a prince, &c. He afterwards published *Ciceronis Consul, Senator, &c.*, with two other treatises, from one of which Conyers Middleton's Life of Cicero was largely compiled—a plagiarism denounced by Dr. Parr in a Latin preface prefixed to a reissue of Bellenden's writings (1787). He died about 1633.

BELLEROPHON. See **HIPPONOUS**.

BELLEROPHON, a genus of gastropodous molluscs, typical of the family Bellerophonitidae. The species are all fossil shells found in the limestones of the Silurian, Devonian, and Carboniferous periods. They are usually assigned to the order Heteropoda, and have nautiloid one-chambered shells, like the living *Argonauta* and *Carinaria*.

BELLES-LETTRES, the French term for which the English equivalent is polite literature. It is impossible to give a satisfactory explanation of what is or has been called belles-lettres; in fact, the vaguest definition would be the best, as almost every branch of knowledge has at one time been included in, at another excluded from, this denomination. The most correct definition, therefore, would be, perhaps, such as embraced all knowledge and every science not merely abstract nor simply useful. In the division of the departments at the Lyceum of Arts, established at Paris in 1792, the belles-lettres comprehended general grammar, languages, rhetoric, geography, history, antiquities, and numismatics; whilst philosophy, mathematics, &c., were called, in contradistinction, sciences. If the name of belles-lettres ought to be retained at all, it would seem proper to include under it poetry, rhetoric, and all prose which has pretensions to elegance.

BELLEVAL, **PIERRE RICHER DE**, a French botanist, born at Chalons-sur-Marne about 1564, deserves notice as the first in France who taught botany as a distinct science from medicine. Henry IV. having been made aware that French students were obliged to go into Italy to study botany, which had made great progress there since the establishment of botanical gardens at Padua, Pisa, and Bologna, determined to form a similar garden at Montpellier, and to create a new chair, the professor of which should teach anatomy in winter and botany in spring and summer. Belleval obtained the first appointment in 1593, but he steadily refused to teach anatomy. He immediately began to make a collection of all the plants in Languedoc in order to the production of an illustrated flora, for which about 500 quarto plates had been engraved, when he died in 1623, before the work could be published. Through the carelessness of his representatives, who sold the plates, almost the whole fruit of his labours was lost.

BELLEVUE (Fr., *fine prospect*), a name given to various villas and palaces, but particularly to a beautiful country palace in the neighbourhood of Paris, situated on the ridge of those hills which stretch from St. Cloud towards Meudon. It was built by Mme. de Pompadour. The building was commenced in July, 1748, and finished in Nov. 1750. After the death of Louis XV. the use of it was granted to the aunts of Louis XVI., mesdames de France. The first French artists of the time had exerted all their talents in embellishing Bellevue; so that this palace, at the period when it was built, was considered the most charming in all Europe. After the revolution the Convention decreed that Bellevue should be kept in repair at the expense of the nation, and that it should be devoted to public amusements. Nevertheless it was publicly sold during the highest pitch of revolutionary excitement, and the purchaser had it demolished. There are now a number of villas and other houses here, forming a pretty village. During the siege of Paris by the Germans in 1870–71 this was an important strategic point.

BELLEY (ancient *Bellio*), a town of France, department Ain, 89 miles π . π . of Bourg, and 38 miles π . π . of Geneva, agreeably situated between two hills, a short distance from the Rhone, in a fertile valley watered by the Furan. It is very ancient, having been a place of note in the time of Julius Cæsar, and is the seat of a bishopric, founded in 412. It contains a communal college, has an agricultural society, and a court of primary resort. The episcopal palace, the belfry of the cathedral, the college, and the rich cabinet of medals and antiquities, are worth notice. Silk-worms are reared; and lithographic stones, reckoned the best in France, are obtained from quarries in the neighbourhood. Pop. (1896), 6070.

BELLIARD, AUGUSTIN DANIEL, COMTE DE, lieutenant-general, peer of France, and sometime French minister in Brussels, distinguished as a general and diplomatist, was born in 1769 at Fontenay-le-Comte, in La Vendée, and entered the military service very early. Dumouriez soon after made him an officer of his staff. He fought at Jemappes, and was raised to the rank of lieutenant-general after the battle of Neerwinden. After Dumouriez had betrayed the Convention and fled, Belliard was carried as a prisoner to Paris, and dismissed from the service; but he soon entered the army again as a volunteer, and was again made lieutenant-general. Under Napoleon, serving in Egypt, Germany, Spain, and Russia, he rose to great military distinction. After the abdication of the emperor he received the order of St. Louis from Louis XVIII., and was made a peer and major-general of the French army. He again ranged himself on the side of Napoleon after his return from Elba, and received from him orders to hasten to King Joachim, in order to direct the operations of the Neapolitan army. The vessel which was to carry him to Naples was chased by a British ship, and obliged to return to France. The Bourbons, after their return, imprisoned him, and placed him under the surveillance of the police, but only for a short time, for, in 1816, he was again a peer, and subsequently fulfilled several important diplomatic missions. During his embassy in Brussels Belliard displayed uncommon activity: he contributed more than any other diplomatist to the foundation of the new Belgian government, and to the preservation of the city of Antwerp when the Dutch General Chassé threatened to lay it in ruins. He died Jan. 27, 1832.

BELLINI, JACOPO, and his two sons, **GENTILE** and **GIOVANNI** (who surpassed their father), celebrated painters, who made a new epoch in the Venetian school. Of Jacopo's works nothing has been left; but several of Gentile's (for example, a St. Mark) have reached our times. Gentile was born in 1421, and in 1479 went to Constantinople, Mohammed II. having sent to Venice for a skilful painter. He is said to have there copied the base-reliefs of the column of Theodosius, and to have died at Venice in the year 1501. Giovanni, more distinguished than either his father or brother, was born at Venice about 1424, and died about 1516. He studied nature diligently, and his drawing was good. He contributed much to make oil-painting popular, and has left many excellent pictures, of which one, the Saviour Pronouncing his Benediction, is to be found in the gallery of Dresden. His own reputation was much increased by that of his celebrated disciples, namely, Titian and Giorgione. As their instructor he is sometimes called the founder of the Venetian school.

BELLINI, VINCENZO, a celebrated composer, born at Catania in Sicily in 1802, was educated at Naples under Zingarelli, commenced writing operas before he was twenty, and composed for the principal musical establishments in Europe. His most celebrated works are *Norma*, *I Puritani*, and *La Sonnambula*. He died of consumption near Paris in 1835. He is remarkable chiefly for sweetness of melody, suitability of harmony, and an adaptation of sound to sense, and stood honourably distinguished from many of his profession by the excellence of his moral character.

BELLISLE. See **BELLE-ISLE**.

BELLMANN, KARL MICKEL, the most original among the Swedish poets, was born at Stockholm in 1740, and grew up in the quietude of domestic life. The first proofs which he gave of his poetical talents were religious and pious effusions. The dissipated life of young men at Stockholm devoted to pleasure was afterwards the subject of his poems. By these his name was spread over all Sweden. Even the

attention of Gustavus III. was attracted to him, and he received from the king an appointment, which enabled him to devote himself almost entirely to poetical pursuits, in an easy independence, until his death in 1795. His songs are truly national, and love and liquor their most common themes.

BELL-METAL. See **BELL**.

BELLONA, the goddess of war, daughter of Phorcys and Ceto. She was called by the Greeks *Enyo*, and is often confounded with Minerva. She was anciently called *Duellona*, and was the sister of Mars, or, according to some, his daughter or his wife. She prepared his chariot when he was going to war, and drove his steeds through the tumult of the battle with a bloody scourge, her hair dishevelled, and a torch in her hand. The Romans paid great adoration to her; but she was held in the highest veneration by the Cappadocians, chiefly at Comana, where she had above 8000 priests. Her temple at Rome was near the Porta Carmentalis. In it the senators gave audience to foreign ambassadors and to generals returned from war. At the gate was a small column, called the *column of war*, against which they threw a spear whenever war was declared. The priests of this goddess consecrated themselves by making great incisions in their bodies, and particularly in the thigh, from which they received the blood in their hands to offer as a sacrifice to the goddess. In their wild enthusiasm they often predicted bloodshed and wars, the defeat of enemies, or the besieging of towns.

BELLOT, JOSEPH RENÉ, a French naval officer, whose personal merits and untimely fate render him an object of melancholy interest, was born at Paris in 1826, of a family in humble circumstances. At the age of sixteen entered the naval academy at Brest, where he continued for two years, and afterwards received a commission as *élève de marine* on board the *Berceau*. For his bravery in an expedition against Tamatave, Madagascar, he was promoted to the rank of an *élève* of the first class, and also created a chevalier of the Legion of Honour, though not yet twenty years old. On his return to France in 1847 he was made a sub-lieutenant, and the following year proceeded in the *Triomphante* to South America, where he remained for two years. Shortly after his return Lieutenant Bellet, who had been led to take a deep interest in the expeditions now being fitted out to the Arctic regions in search of Sir John Franklin, obtained permission from the French government to volunteer his services, which were readily accepted. In June, 1851, he embarked on board the *Royal Albert* schooner, fitted out by Lady Franklin, and commanded by Captain Kennedy. The voyage was ineffectual, but unattended with any disaster, and an interesting journal of it, kept by Bellet, was published after his death. In June, 1853, he sailed again on board the *Phénix*, under the command of Captain Inglefield, on a new Arctic expedition, the principal object of which was to convey despatches to Sir Edward Belcher, then commanding H.M.S. *Assistance* in the Polar sea. The *Phénix* reached safely Erebus and Terror Bay, where it found the *North Star*, whose commander, Captain Pullen, was absent on a journey of discovery. Captain Inglefield resolved to set out in search of him, but in his absence it became desirable to get the despatches conveyed to Sir Edward Belcher—a duty which Lieutenant Bellet undertook to perform by crossing the ice. Having set out with four sailors, a canoe, and a sledge, the party got separated in a gale of wind on the 18th of August, and Bellet, with two others, was drifted away on a piece of ice. With the view of ascertaining the direction the ice was taking, he crossed over to the opposite side of the hummock, and was never seen more. This was

all the information that could ever be learned of his fate. In testimony of the universal respect which his gallantry and personal worth had inspired, a subscription was afterwards entered into, by which a handsome granite obelisk was erected to his memory in front of Greenwich Hospital, and a provision made for his sisters.

BELLOWS, a machine for blowing fire, so formed as, by being dilated and contracted, to inhale air by a lateral orifice, which is opened and closed by a valve, and to propel it through a tube upon the fire. As soon as men began to make use of fire the importance of bellows was felt, since the natural bellows, if we may give this name to the lungs, could not be applied to any great extent. The invention of bellows is ascribed to Anacharsis the Scythian, though probably it took place in different countries. The forms of bellows at present are very various, as many attempts have been made for the improvement of this highly important machine, which becomes necessary wherever a powerful flame is required in the arts. As mining was carried on at an early date in Germany, and great heat is required in smelting the ores and working the metals, various new kinds of bellows were invented in that country, one of which consists of an empty box, which moves up and down in another, partially filled with water. Between the bottom of the empty box and surface of the water is a space filled with air, which is driven out by the descent of the inclosed box. Bellows of very great power are generally called *blowing-machines* (which see). One of the largest is at work in the smithy of the Royal Dockyard at Woolwich. It is adequate to the supply of air for forty forge-fires, amongst which are several for the forging of anchors, iron knees, and many other heavy pieces of smithery. The common Chinese bellows consist of a box of wood about 2 feet long and 1 foot square, in which a thick, square piece of board, which exactly fits the internal cavity of the box, is pushed backwards and forwards. In the bottom of the box, at each end, there is a small conical or plug valve to admit the air, and valves above to discharge it.

BELLOWS-FISH. See SEA-SNIPES.

BELLOY, PIERRE LAURENT BURETTE DE, the first French dramatist who successfully introduced native heroes upon the French stage, was born at St. Flour, in Auvergne, on the 17th of Nov. 1727. He went to Paris when a child, lost his father soon after, and was supported by his uncle, a distinguished advocate in the Parliament of Paris, who designed him for the same profession. He applied himself to this profession with reluctance, while he showed much genius for the drama. His uncle opposed this taste, and the young man secretly left his house. He now made his appearance at several northern courts as an actor, under the name of *Dormont de Belloy*. Belloy had hoped to reconcile his family to him by the success of his first tragedy, *Titus*, but this hope was disappointed by the failure of the piece; and the author went to St. Petersburg. Shortly after, his uncle died, and Belloy returned again to France, where he brought out his tragedy *Zelmire*, which was acted with the most complete success. In 1765 followed his *Siege de Calais*, a tragedy which produced a great sensation, and is still esteemed, though it owes the applause bestowed on it rather to its subject than to its poetical merit. He received the medal promised by the king to those poets who should produce three successful pieces, and which was awarded only on this occasion. On account of the great applause with which the *Siege de Calais* was received, it was counted as two, it being, in fact, only the second successful piece of Belloy.

The city of Calais sent him the freedom of the city in a gold box, with the inscription *Lauream tulit, civicom recipit*. Belloy wrote sundry other dramatic pieces, of which *Gaston et Bayard* procured his reception into the Académie Française. He died 5th March, 1776.

BELL ROCK, a dangerous reef of sunken rocks on the east coast of Scotland, about 12 miles from Arbroath, and lying right in the fairway of vessels making for the firths of Forth and Tay. The Inchcape or Bell Rock reef was long the terror of seamen, and on it numerous vessels were wrecked. At a very early period the Inchcape Rock was unhappily too well known, and tradition has it that one of the Abbots of Aberbrothock succeeded in placing a bell upon it (hence the name), in such a way as to be rung by the motion of the waves, to warn sailors of its proximity. The legend tells us that a notorious Dutch sea pirate cut the bell from the rock, and on returning with his ship laden with spoils from one of his piratical expeditions, he and his crew perished, as an old historian has it, 'by the righteous judgment of God', for want of the signal which he had so wantonly removed. On this legend Southey has founded his well-known ballad of 'Sir Ralph the Rover'.

Mr. Robert Stevenson, the engineer of the Commissioners of Northern Lighthouses, had been carefully considering the nature of the building best suited to such an exposed place. While he was working out the problem, the winter of 1799 was rendered memorable by the unusual violence of a storm which ravaged the whole eastern sea-board. Many vessels and their crews were lost on that dark, dismal night of December, two of them on the Inchcape Rock, and in 1800 Stevenson designed the structure which now guards this rock. A bill was brought into Parliament in 1803, by the Commissioners of Northern Lighthouses, for the purpose of carrying out Stevenson's design. This bill passed the Commons, but some opposition was raised regarding the dues to be levied to defray the cost, and the bill was withdrawn. Before going again to Parliament, the Commissioners, as is usual in important engineering works, wished their engineer's design to be corroborated. Telford was applied to, but was unable to take the matter up, and on Stevenson's suggestion Rennie was called in, and concurred in Stevenson's proposals. A bill was accordingly applied for, and after evidence by Stevenson, which was concurred in by Rennie, the act was passed on 21st July, 1806. Operations were commenced in 1807, and after four seasons' arduous work in overcoming almost insurmountable difficulties the building was completed, and on the 1st of February, 1811, the light was shown for the first time to the mariner. Since that date not a single wreck has happened on the Inchcape Rock. The expense of the whole, including the shore station for the lightkeepers' families at Arbroath, was about £61,000. The construction of the tower, which is now the oldest rock lighthouse tower in Britain, was executed under the personal superintendence of Stevenson, who, in 1824, published an account of it in a quarto volume, which has, not inaptly, been described as the 'Robinson Crusoe of Engineering', and Dr. John Brown has styled it the 'Romance of Stone and Lime'.

The Bell Rock Tower is circular in plan, 100 feet in height, 42 feet in diameter at the base, decreasing to 15 feet at the top, while the foundation is submerged to a depth of 12 to 16 feet at high water. The first 30 feet are 'solid', and here the entrance doorway is placed, which is reached by a bronze ladder. The interior of the tower is divided into six stories, one of them being the library, in which, on the com-

pletion of the work, the Commissioners placed a base of Stevenson, by Joseph, and recorded in their minutes that to 'Mr. Stevenson is due the honour of conceiving and executing the great work of the Bell Rock Lighthouse'. Among other improvements on previous towers—improvements which have been introduced in all subsequent lighthouse rock towers—Stevenson made each floor form part of the outward wall extending inwards to a centre stone so as to bind the walls together. The best light apparatus which was then known was introduced, consisting of reflectors with Argand lamps, and in order that the light might easily be distinguished from other lights, it was made revolving, red and white alternately. The optical apparatus has been (1902) converted to the dioptric system, but the character of red and white has been retained. A tonite fog signal, fired every five minutes, was introduced in 1890. During easterly storms green seas rise to a height of 70 feet on the tower, and deluge the balcony and parapet with heavy spray.

The following is Sir Walter Scott's *impromptu* 'Pharos Loquitur', written in the album of the lighthouse, when he landed with a deputation of the Commissioners in 1814:—

'Far in the bosom of the deep,
O'er these wild sholes my watch I keep;
A ruddy gem of changeful light,
Bound on the dusky brow of night;
The seaman bids my lustre hail,
And scorns to strike his timorous sail.'

See article LIGHTHOUSE.

BELOOCHISTAN, a country in the south of Asia, lying between Persia and the valley of the Indus, having the former on the w., Afghanistan on the n., Scinde on the e., and the Arabian Sea on the s.; area, about 130,000 square miles. It is wholly under British influence and partly under British rule, while the Khan of Kalat is ruler of a considerable portion, and certain tribes are independent. The general surface of Beloochistan is rugged and mountainous, with some extensive intervals of barren sandy deserts. The directions of the numerous mountain-chains with which it is intersected are still imperfectly known, except in the case of a few of the principal ranges, and of these the general parallelism and uniformity are somewhat remarkable, one system having an inclination from N. to s., another from E. to W. Many of these mountains are of great height, and covered with snow. There are several broad and high table-lands, extremely cold in winter and extremely hot in summer. Mekran in the south, the ancient Gedrosia, is one of the hottest regions of the globe. The geology of Beloochistan, like all its other physical features, is but imperfectly known. Some of the mountain-chains are of compact limestone, inclosing marine shells and corals, identical with similar objects picked up on the sea-shores at this day. Excepting fragments of quartz found in Lus, primary formations have not been observed in any part of the Beloochistan mountains. The mineral wealth of the country is believed to be considerable, including gold, silver, lead, iron, copper, many kinds of mineral salts, and saltpetre. Throughout Beloochistan there is a great deficiency of water, particularly in summer. In the north-east part are the rivers Bolan and Mula, the courses of which form the celebrated passes bearing their names, leading from the valley of the Indus to Beloochistan and Afghanistan. The soil is not in general fertile, but by patient industry the plains and valleys can be made productive in wheat, barley, and millet. The other chief crops are madder, cotton, particularly in Cutch Gundava, rice, indigo, and tobacco. Vegetables are abundant, and excellent fruits are produced

in the gardens and orchards in the neighbourhood of the towns. Excellent camels are bred in large numbers.

The inhabitants are divided into two great branches, the Beloochees and Brahooches, different in their language, figure, and manners, and each subdivided into a number of minor tribes. The Brahooches have greater physical strength than the Beloochees, and are less addicted to predatory violence. Both races are hospitable, brave, and capable of enduring much fatigue. Many of them live in rude tents made of black felt or coarse cloth, of goat's or camel's hair, stretched over a frame of wicker-work. Both Beloochees and Brahooches are very ignorant but zealous Mohammedans. The Beloochee language resembles the modern Persian, the Brahooches presents many points of agreement with the Hindoo. The manufactures are mostly confined to coarse fabrics and a few matchlocks and other weapons, and the trade is unimportant. The Khan, so far as his rule extends, has unlimited power over life, person, and property. He usually resides at Kelat, and his rule is almost confined to the country around it. Quetta is the largest town. It is occupied by a British garrison and strongly fortified.

About the middle of the 18th century Beloochistan was made tributary by Nadir Shah, who bestowed it, with the title of beglerbeg, or commander-in-chief, on Nasir Khan, who proved himself the ablest ruler that ever governed the country. On his death in 1795 he left the country in a comparatively prosperous condition, but it has since suffered greatly from intestine wars, and its boundaries have been curtailed. During the Afghan war in 1839 a British force was detached to assault Kelat, which was taken by storm after a siege of a few hours, Nov. 13 the same year. It was again occupied by the British in 1840, but in the following year they left the country. Latterly a British protectorate over the whole of Beloochistan has been established, and the town of Quetta (which is now reached by railway from India) and a part of the country have been absolutely annexed. The Khan receives an annual subsidy from India. The population is estimated at about 500,000.

BELPER, a market town, England, county of Derby, in a valley, on the left bank of the Derwent, over which there is a handsome stone bridge of three arches, 7 miles N. of Derby, on the Midland Railway. The older houses of the town are fast disappearing, and are being replaced by handsomer and more commodious buildings; while numerous neat villas, with flower-gardens, orchards, &c., attached, are fast rising on the elevated grounds around the town. It has three churches, besides other places of worship, a public hall, with reading-rooms, library, &c. There are large cotton-mills, hosiery works, engineering works, and foundries. Belper is a thriving town and has been very much improved since about 1890. Pop. in 1891, 10,420; in 1901, 10,934.

BELSHAM, THOMAS, a Unitarian minister, born in 1750, became theological tutor of an academy at Daventry in 1781. At this time he was a Calvinist, but a change of views unfitted him for this situation, and he became tutor of an academy which had been recently established at Hackney. This institution soon sunk for want of funds, and Belsham removed first to the Gravel Pit Chapel, which had been occupied by Dr. Priestley, and afterwards to Essex Street Chapel, where he officiated for some time as the colleague of Mr. Lindsey, and latterly as sole pastor till his death in 1820. His works are chiefly of a controversial nature, and probably attracted attention as much from the celebrity of the works which they attacked as from their own merits. His first appearance in the polemical

held was as an opponent of Mr. Wilberforce, of whose celebrated Practical View of the Prevailing Religious Systems he published a review. He also published Memoirs of Mr. Lindsey, which was reviewed by the celebrated Robert Hall.

BELSHAM, WILLIAM, a miscellaneous writer of some eminence, who died in 1827, aged seventy-five. He published in 1789 Historical, Political, and Literary Essays (two vols. 8vo); and he subsequently wrote on the test law, the French revolution, parliamentary reform, and other subjects; but his principal work is a History of Great Britain, from the Revolution to the Treaty of Amiens (1793-1806, twelve vols. 8vo).

BELSHAZZAR, the last of the Chaldean dynasty who reigned at Babylon. He is supposed to have been the son of the Nabonnedus of Berosus, Labyrinthus of Herodotus, and Nabonandus of Josephus, and to have been adopted by his father as joint king some time before the fall of Babylon. He perished a.d. 538, during the successful storming of Babylon by Cyrus. The interesting circumstances which immediately preceded this event, and are recorded at length in the book of Daniel, have repeatedly furnished subjects to painters and poets.

BELT; THE GREAT AND LITTLE, two straits of Denmark, connecting the Baltic with the Cattegat. The former runs between the islands of Zealand and Funen, and is about 15 miles in width, where it is crossed from Nyborg, in Funen, to Corsoer, in Zealand. The greatest breadth of the strait is 20 miles. The navigation is very dangerous, on account of the many small islands and sand-banks by which the channel is impeded. The Little Belt is between the island of Funen and the coast of Jutland, and the narrowest part of the strait is not more than a mile in width. At this place stands the fortress Fredericia, where the tolls were paid. The fortress commands completely the entrance from the Cattegat. The Sound, between Zealand and the Swedish coast, is preferred for all large vessels entering or leaving the Baltic.

BELTEIN, or BELTANE, a kind of festival formerly observed on the 1st of May by the Celtic population of Ireland and Scotland, and indeed common at one time to all Celtic nations. We have accounts of its being celebrated even as lately as the beginning of the present century. The chief ceremony connected with the Beltain consisted in lighting fires on the hill-tops, in which sacrifices, in very remote times probably human sacrifices, were offered. According to Dr. Keating, the animals were not sacrificed in the flames, but merely driven through them, which was considered to secure them against contagious diseases during the year; but although this may have been the practice in later times, it seems more likely that the animals were originally actually sacrificed. When the Beltain fires were lighted it was compulsory upon all first to have their fires extinguished, and in early times this seems to have been enforced with great rigour. The domestic fires were afterwards rekindled from the embers of the Beltain fire. The meaning of the word Beltain is doubtful. Some assert that Beltain means fire of Beal, who is said to have been the Celtic god of light. Others connect the word with the Slavonic *bel*, white. The 1st of May was chosen, it is said, for this festival because May is the month in which the sun, the great source of light, begins to recover his lost splendour. From the similarity of the name to the Phœnician Beal, and the Assyrian Bel, many have identified the Celtic god with the other two; but there is no reason to suppose that the Beltain observances were derived from the worship of Beal.

BELVEDERE (Ital. *fine sight*. See BELIEVE). The name of buildings in Italy destined for the enjoyment of prospects. The name is also given to the small cupolas on houses which are ascended for the sake of fresh air, or of the view which they afford. Many of the buildings in Rome are furnished with such cupolas; yet the term *belvedere* is generally applied only to those on the palaces of the rich. This is the name also of a part of the Vatican where the famous statue of Apollo is placed, which, on this account, is called Apollo Belvedere.

BELZONI, GIOVANNI BATTISTA (John Baptist), an enterprising traveller, was born at Padua in 1778, and educated at Rome. He was destined for the monastic life, but left the city when it was occupied by the French armies, and in 1803 went to England, where he acted the parts of Apollo and Hercules at Astley's Amphitheatre. Here he acquired, besides an acquaintance with the English language, much knowledge of the science of hydraulics, the study of which had been his chief occupation in Rome, and which afterwards carried him to Egypt. He left England, after a residence of nine years, accompanied by his wife (who faced the Arabs with the courage of an Amazon), and took his way through Portugal, Spain, and Malta, to Egypt. There he lived from 1815 to 1819, at first as a dancer, till he won the favour of the pasha, who made use of his services. Belzoni, though often alone amidst the rude inhabitants of the country, kept them in awe by his extraordinary stature and strength. He succeeded in opening the second of the pyramids of Ghizeh, known by the name of Cephrenes. In the year 1816 his perseverance and skill succeeded in transporting the bust of Memnon from Thebes to Alexandria, from whence it came to the British Museum. In 1817 he entered several catacombs near Thebes, especially one in a fine state of preservation in the valley of Biban el Molook, which is considered to be the mausoleum of Psammetichus, and from which he took the splendid alabaster sarcophagus which is now contained in the British Museum. On the 1st of August in the same year he opened the temple of Ipwambul, near the second cataract of the Nile, which two Frenchmen, Cailliaud and Drovetti (the French consul-general), had discovered the year before, but had not succeeded in opening. Belzoni discovered a subterranean temple in its ruins, which until that time had been unknown. He then visited the coasts of the Red Sea and the city of Berenice, and made an expedition into the Oasis of Jupiter Ammon. His journey to Berenice was rewarded by the discovery of the emerald mines of Zuhara. Belzoni refuted Cailliaud's assertion, that he had found the famous Berenice, the great emporium of Europe and India, by subsequent investigations on the spot, and by the actual discovery of the ruins of that great city four days' journey from the place which Cailliaud had taken for Berenice. Belzoni's Narrative of the Operations and Recent Discoveries within the Pyramids, Temples, Tombs, and Excavations in Egypt and Nubia; and of a Journey to the Coast of the Red Sea in Search of Berenice; also of another to the Oasis of Jupiter Ammon (London, 1820); accompanied by a folio vol. of forty-four copper-plates was received with general approbation. Padua, his native city, requited his present of two Egyptian statues from Thebes, with a medal by Manfredini. In the year 1823 this enterprising traveller had made preparations for passing from Benin to Houssa and Timbuctoo, when he died at Gato, on his way to Benin, Dec. 8, 1823. He believed the Nile and Niger to be different streams, and that the Niger empties its waters into the Atlantic Ocean; opinions which have long been proved to be correct.

BEM, JOSEPH, a distinguished military commander, was a native of Poland, and born at Tarnow, in Galicia, in 1795. He was educated at the University of Cracow, and distinguished himself greatly in mathematical science. In 1810 he was admitted into the corps of cadets founded at Warsaw by Napoleon, afterwards entered the horse artillery, and took part as lieutenant in the expedition of the French army to Russia. For the bravery here displayed by him he received the decoration of the cross of the Legion of Honour. On hearing of the outbreak of the Polish revolution, he at once hurried to Warsaw, and during the whole of the Polish struggle he displayed great gallantry and military skill. On the night of 7th September, 1831, he held the bridge of Praga with his artillery, but the following morning, on hearing of the agreement concluded with the Russians, withdrew to Modlin. After the fall of Warsaw he went to Prussia, and in 1832 to Paris, where he resided for the next sixteen years, occupied partly with political schemes, partly with scientific pursuits. Upon the commencement of the Austrian insurrection in 1848, General Bem proceeded there, and having volunteered his services to the revolutionary party, took a prominent part in conducting the defence of Vienna against the imperial troops. Immediately before the surrender of the capital he disappeared; but shortly afterwards he reappeared at Presburg. Towards the end of the year he received a commission from the new Hungarian government to undertake the conquest of Transylvania, and crossed over into that territory at the head of a large army, raised by his own exertions in an incredibly short space of time. His progress here was marked by great successes, with occasional checks; and in March, 1849, he succeeded in driving the Austrians, with their Russian auxiliaries, into Wallachia. He subsequently made an incursion into the Banat, which he compelled Fuchser to evacuate. Returning to Transylvania, he found himself opposed by overwhelming numbers, and, after several reverses, returned to Hungary, where he took part in the disastrous battle of Temesvár. Shortly after he went to Turkey, became a convert to Mohammedanism, and received an appointment in the Sultan's army under the name of Amurath Pasha. In Feb. 1850 he was directed, along with other Hungarian exiles, to take up his abode at Aleppo, where a fever carried him off on 10th December of the same year.

BEMBECIDÆ, a family of wasp-like hymenopterous insects with stings, mostly natives of warm countries, and known also as sand-wasps. The female excavates cells in the sand, in which she deposits, together with her eggs, various larvæ or perfect insects stung into insensibility, as support for her progeny when hatched. The insects are very active, fond of the nectar of flowers, and delight in sunshine. *Bembex* is the typical genus of the family.

BEMBO, PIETRO, a celebrated Italian scholar of the sixteenth century, was born at Venice in 1470. He very early learned the Latin, and afterwards, at Messina, under the direction of Lascaris, the Greek language. At Ferrara he completed his philosophical studies, and thence he returned to Venice, where he became a member of a literary society which had been established in the house of the printer Aldus Manutius. After visiting Rome he went in 1508 to the court of Urbino, at that time one of those Italian courts where the sciences stood highest in esteem. In 1512 he went to Rome, where Pope Leo X. made him his secretary. About this time Bembo became acquainted with the young and beautiful Morosina, with whom he lived in the most tender union during twenty-two years. She presented him

with two sons and a daughter, whom he educated with the greatest care. His many labours arising from his office, as well as his literary pursuits, and perhaps too great an indulgence in pleasure, having impaired his health, he was using the baths of Padua when he was apprised of the death of Leo X. Being by this time possessed of several church benefices, he resolved on withdrawing entirely from business, and on passing his days at Padua occupied only with literature and science, and enjoying the society of his friends. Bembo collected a considerable library: he had a cabinet of medals and antiquities, which at that time passed for one of the richest in Italy, and a fine botanical garden. In the year 1529 the office of historiographer of the republic of Venice was offered to him, which he accepted after some hesitation, declining the salary connected with it. At the same time he was nominated librarian of the library of St. Mark. Pope Paul III., having resolved upon a new promotion of cardinals, from the most distinguished men of his time, conferred on him, in 1539, the hat of a cardinal. From that time Bembo renounced the belles-lettres, and made the fathers and the Holy Scriptures his chief study. Of his former labours he continued only the History of Venice. Two years later Paul III. bestowed the bishopric of Gubbio on him, and soon after the rich bishopric of Bergamo. He died loaded with honours, in 1547. A collection of all his works, which were frequently printed singly, appeared in 1729, at Venice, in four folio vols. The most important of them are: History of Venice from 1487 to 1513, in twelve books, which he wrote both in Latin and Italian; *Le Prose*, dialogues in which the rules of the Italian language are laid down; *Gli Asolani*, dialogues on the nature of love; and *Le Rime*, a collection of beautiful sonnets and canzonets.

BEMBRIDGE BEDS, in geology, a fossiliferous division of the Upper Eocene strata, principally developed at Bembridge, in the Isle of Wight, consisting of marls and clays resting on a compact, pale-yellow or cream-coloured limestone, called Bembridge limestone. Their most distinctive feature is the mammalian remains of the *Palaotherium* and the *Anoplotherium*.

BEN, a Gaelic word signifying mountain, prefixed to the names of many mountains in Scotland north of the Firths of Clyde and Forth, as Ben Nevis, Ben MacDhui, &c.

BEN (Hebrew, *son*), a prepositive syllable found in many Jewish names, as *Bendavid*, *Benasser*, &c., which, with the Jews in Germany, has been changed into the German *Sohn* (son), for example, *Mendelssohn*, *Jacobsohn*, &c.

BEN, OIL OF, the expressed oil of the ben-nut, the seed of *Moringa pterygosperma*, the ben or horseradish tree of India. The oil is inodorous, does not become rancid for many years, and is used by perfumers and watchmakers.

BENARES, a division or commissionership in the North-western Provinces of India, and an executive district and town in the same. The area of the division is 10,414 square miles, largely made up of rich cultivated flats on each side of the Ganges. The heat in summer is excessive, but in winter fires are requisite. Garden stuffs, grain of different kinds, flax for oil (no linens are manufactured here), and sugar, are the principal objects of cultivation. Rice, for which many parts of the soil seem well adapted, is seldom grown. Muslin, silk, and gauzes, salt, indigo, and opium, are made very extensively. The principal town is Benares. The pop. (1891), is 5,368,774, and the Hindus greatly outnumber the Mussulmans. The area of the district is 1099 square miles, and the population in 1891, 921,943.

BENARES (in Sanscrit, *Vārāṇasī*), a town in Hindustan, N. W. Province, in the division of the same name, on the left bank of the Ganges, from which it rises like an amphitheatre, presenting a splendid panorama of temples, mosques, palaces, and other buildings, with their domes, minarets, &c. Fine ghats lead down to the river. It is built of freestone, and contains many handsome and highly decorated houses, but the height of the houses and narrowness of the streets give it all the usual inconveniences of an Asiatic town. *Kasi*, the *Splendid*, as the Hindus commonly call it, is one of the most sacred places of pilgrimage in all India, being the head-quarters of the Hindu religion. To die at Benares is the greatest happiness for a Hindu, because he is then sure of immediate admission into heaven. The number of pious foundations and temples is exceedingly great. There is a continual influx of wealthy pilgrims into the city, and many of the Hindu princes have a town residence here. The principal temple is called *Bishnwar*, and is dedicated to *Siva*. *Aurangzeb* built a splendid mosque on the highest ground in the city, and it is the most prominent object from the river side. At the end of the seventeenth century an observatory was erected in this city by one of the *rajahs*, which still exists. One of the temples has a great number of sacred monkeys attached to it. Altogether there are about 1500 Hindu temples. Of European buildings the government college, *Prince of Wales'* hospital, and town-hall are the chief. Benares carries on a large trade in the produce of the district and in English goods, and manufactures silks, shawls, embroidered cloth, jewelry, &c. The merchants and bankers are numerous and wealthy. There are few English inhabitants, except the government officers, and the members of the various missions. *Kasi* was ceded to the East India Company by the *Nabob* of *Oude* in 1776. During the mutiny of 1857 a serious outbreak occurred here. The population in 1872 was 175,188, including the cantonments at *Sikraul* (*Sero-le*); in 1881, 199,700; in 1901, 203,095.

BENBOW, JOHN, an English vice-admiral, son of a tanner of Shrewsbury, was born in 1653, and was brought up to the sea in the merchant service. After serving for some time in the navy he again entered the merchant service. He fought so desperately against a pirate from *Saltee*, in one of his trips to the Mediterranean, about the year 1686, as to beat her off, though greatly his superior in men and metal. He re-entered the navy after the revolution, and was employed in protecting the English trade in the Channel, which he did with great effect. His valour and activity secured him the confidence of the nation, and he was soon promoted to the rank of rear-admiral, and charged with operations against *Dunkirk* and the French coasts. But the French squadron under the command of *Du Hart*, managed to keep out of his reach. In 1698 he was sent to put down the pirates in the *W. Indies*, and not long after returning, he again sailed to the *West Indies* with a small fleet, having accepted a command previously declined by several of his seniors, from the supposed superiority of the enemy's force in that quarter. In August, 1702, he fell in with the French fleet under *Du Casse*, and for five days maintained a running fight with them, when he at length succeeded in bringing the enemy's sternmost ship to close-quarters. In the heat of the action a chain-shot carried away one of his legs, and he was taken below; but the moment the dressing had been applied to the wound he caused himself to be brought again on deck, and continued the action. At this critical instant, being most disgracefully abandoned by several of the captains under his command, who signed a paper expressing their opinion that "nothing

more was to be done", the whole fleet effected its escape. Benbow, on his return to *Jamaica*, brought the delinquents to a court-martial, by which two of them were convicted of cowardice and disobedience of orders, and condemned to be shot; which sentence, on their arrival in England, was carried into execution at *Plymouth*. Benbow, who suffered equally in mind and body from this disgraceful business, gradually sank under his feelings, and expired at *Jamaica*, Nov. 4, 1702.

BENCŒOLEN (Dutch, *Bemkoelen*), a seaport of *Sumatra*, on the s.w. coast; lon. 102° 19' E.; lat. 8° 47' 30" S. The English settled here in 1685, and in 1690 the East India Company built a fort here, calling it *Fort York*. In 1825 *Bencœolen* was yielded up to the Dutch in exchange for the settlements on the *Malay Peninsula*. A convenient river on its n.w. side brings the pepper out of the inland country; but there is great inconvenience in shipping it, by reason of a dangerous bar at the river's mouth. The place, which is almost 2 miles in compass, is known at sea by a high, slender mountain, which rises in the country 20 miles beyond it, called the *Sugar Loaf*. It is inhabited by a mixed population. The medium heat throughout the year is from 81° to 82°. Pepper is the chief produce of the adjacent country, which is mountainous and woody. The place is unhealthy and subject to earthquakes; storms are frequent. Pop. 6000.

BENDER, a city of *Russia*, gov. *Bessarabia*, on the *Dniester*, a large straggling place, chiefly consisting of low houses and mere huts. It formerly possessed a strong fortress, but this was dismantled in 1807. Its commerce is important. After being several times taken from the *Turks* by the *Russians*, it has belonged to *Russia* since the peace of *Bucharest*, in 1812. Pop. (1897), 32,934.

BENDIGO, formerly *SANHUHST*, a city of *Australia*, in *Bendigo* county, *Victoria*, on *Bendigo Creek*, fully 100 miles N.W. of *Melbourne*, with which it has direct railway communication. It is one of the chief cities in the colony and an important railway centre. Along one side of its main street (*Pall Mall*) there are fine buildings of brick and stone, and facing these, in *Rosalind Park*, are the elegant government buildings and the law-courts, which together cost nearly £80,000. Other buildings worthy of mention are the handsome town-hall, mechanics' institute, with library and school of mines; free library; temperance, masonic, and other halls; hospital, benevolent asylum; some fine banks; Anglican, Wesleyan, Presbyterian, and other churches; Roman Catholic Cathedral, to cost £80,000, in course of erection; art gallery, jail, state and other schools, &c. The public parks comprise, besides the *Rosalind Park*, the fine *Botanic Gardens* and two others largely used for sports. The streets are lighted by gas and electricity, and there is an excellent water-supply from large reservoirs near the town. The chief industry of the district is gold-mining, which gives employment to 5000 miners. Other important industries are brewing, iron-founding, stone-cutting, granite-polishing, tanning, and the manufacture of pottery, bricks, tiles, cordials, &c. Agriculture and viti-culture are carried on in the district, and there is a trade in wine and fruits. *Bendigo* was founded at the time of the gold discovery in 1851. Nearly £70,000,000 worth of gold has been obtained here, much of it from quartz reefs. Pop. (1898), 30,280.

BENEDICT, the name of no fewer than fourteen popes, commencing with the first of the name who was elected to the papal chair on the death of *John XII.* in 574. The first deserving of notice is *Benedict IX.*, who succeeded *John XIX.* in 1038.

He was a mere boy at the time of his election, and obtained it through family interest and bribery. His licentiousness plunged Rome into a state of anarchy, and he was ignominiously expelled by the citizens, who elected a successor known by the name of Sylvester III. Six months after Benedict returned, regained the ascendancy, and excommunicated Sylvester; but finding the general detestation too strong to permit him to resume his chair, sold it to John Gratianus, who assumed the title of Gregory VI. There was thus a trio of popes, and the emperor, Henry III., to put an end to the scandal thus occasioned, assembled a council at Sutri, which got quit of the difficulty by deposing all the three. The ultimate fate of Benedict is not well known, but he is believed to have died in a convent. The next Benedict deserving of notice was the thirteenth of the name, originally Cardinal Orsini, and Archbishop of Benevento, who became pope in 1724. His private character appears to have been unexceptionable, but he bestowed his confidence on Cardinal Coscia, who was unworthy of it, and abused it in gratifying his avarice. Before he obtained the papedom he must have been at least a laborious writer; for his works, including sermons, fill three vols. folio. He died in 1780, and was succeeded by Clement XII.

BENEDICT XIV., PROSPERO LAMBERTINI, born at Bologna in 1675, of a very respectable family, distinguished himself in his youth by a rapid progress in all the sciences. His favourite author was St. Thomas. He applied himself with success to the canon and civil law, and became advocate to the consistory at Rome. Afterwards he was appointed *promotor fidei*, and wrote a valuable work on the Ceremonies used in Beatifications (Bologna, 1734, four vols. folio). He was passionately fond of learning, of historical researches, and monuments of art, and also associated with the distinguished men of his time; among others with Father Montfaucon, who said of him, 'Benedict has two souls; one for science, and the other for society.' He also made himself familiar with the best poetical works, whereby his mind became elevated and his style animated. Benedict XIII. made him, in 1727, bishop of Ancona; in 1728 cardinal, and in 1732 archbishop of Bologna. In every station he displayed great talents, and fulfilled his duties with the most conscientious zeal. He opposed fanaticism even at the risk of his own safety, defended the oppressed, and expressed himself with the greatest frankness to Clement XII. without losing his favour. When, after the death of Clement XII. in 1740, the election of a new pope in the conclave was retarded by the intrigues of Cardinal Tencin, and the cardinals could not agree, Lambertini, with his usual good nature, said to them, 'If you want a saint, take Gotti; if a politician, Aldobrandi; if a good old man, myself.' These words, thrown out in a humorous manner, operated on the conclave like inspiration, and Lambertini, under the name of Benedict XIV., ascended the papal throne. His choice of the ministers and friends whom he assembled around him does the greatest honour to his judgment. The condition of the church and of the Roman court had not escaped his penetration. Since the Reformation princes no longer trembled at the thunders of the Vatican. The popes had renounced their pretensions to worldly authority, and Lambertini knew that respect for the papal authority could be maintained only by a wise moderation. He constantly regulated his measures by this principle, and thus succeeded, even in difficult circumstances, in satisfying not only the Catholic but even the Protestant princes. The sciences were a special object of his care. He established academies at Rome; promoted the prosperity of the academy

at Bologna; caused a degree of the meridian to be measured; the obelisk to be erected in the Campus Martius; the church of St. Marcellino to be built after a plan projected by himself; the beautiful pictures in St. Peter's to be executed in mosaic; the best English and French works to be translated into Italian; and commanded a catalogue of the manuscripts contained in the Vatican library (the number of which he had enlarged to 3800) to be printed. His government of the Papal States did equal honour to his wisdom. He enacted severe laws against usury, favoured commercial liberty, and diminished the number of holidays. His piety was sincere, yet enlightened and forbearing. He strove to maintain purity of doctrine and of morals, giving in his own character the most praiseworthy example. He died after a painful sickness, during which his cheerfulness and vivacity never deserted him, May 3, 1758. The sole reproach brought against him by the Romans was that he wrote too much and governed too little. His works compose, in the Venice edition, sixteen vols. folio. The most important of his works is that on the Synods, in which we recognize the great canonist.

BENEDICT, St., the founder of the first religious order in the West; born at Norda, in Spoleto, in the province of Umbria, in Italy, A.D. 480. In the fourteenth year of his age he retired to a cavern situated in the desert of Subiaco, 40 miles from Rome, and in 515 drew up a rule for his monks, which was first introduced into the monastery on Monte Cassino, in the neighbourhood of Naples, founded by him (529) in a grove of Apollo after the temple had been demolished. This gradually became the rule of all the western monks. The abbots of Monte Cassino afterwards acquired episcopal jurisdiction, and a certain patriarchal authority over the whole order. Benedict, with the intention of banishing idleness, prescribed, in addition to the work of God (as he called prayer and the reading of religious writings), the instruction of youth in reading, writing, and ciphering, in the doctrines of Christianity, in manual labours (including mechanic arts of every kind), and in the management of the monastery. With regard to dress and food, the rule was severe but not extravagant. Benedict caused a library to be founded, for which the aged and infirm brethren (*ordo scriptorius*) were obliged to copy manuscripts. By this means he contributed to preserve the literary remains of antiquity from ruin; for though he had in view only the copying of religious writings, yet the practice was afterwards extended to classical works of every kind; and the learned world is indebted for the preservation of great literary treasures to the order of St. Benedict. See BENEDICTINES.

BENEDICTBEUERN, formerly an abbey situated in the Bavarian circle of the Isar, about 40 miles distant from the city of Munich, on the descent of the mountains northwards from the Tyrol. The convent was founded as early as 740, and was abolished in 1803. The fine abbey church still remains. The Bavarian government has here a depot for army horses, and a veterinary establishment; and there is also a residence for invalids.

BENEDICT BISCOF, an Anglo-Saxon monk of the seventh century, born of a noble Northumbrian family in 628 or 629. He spent the first years of his life at court, but at the age of twenty-five he relinquished this manner of life and accompanied Wilfrid on a pilgrimage to Rome in 653. Here he lived for more than ten years, when he returned to England; but not very long after, he again went to Rome, this time on a mission intrusted to him by Alchfrid, king of Northumbria. On his way back he stopped at Lerins in Provence, where he remained

for the next two years, making himself acquainted with the rules of monastic life in the monastery of Lerins, of which he had become a member. In 668 he left Lerins and made a third journey to Rome, where he arrived just at the time when the pope was about to appoint some one to fill the see of Canterbury, which was then vacant. Having fixed upon Theodore, a Cilician monk, he requested Benedict to accompany him to England to assist him in securing the favour of the Anglo-Saxons, which as a foreigner he might have difficulty in doing. Benedict agreed to do this, and was presented with the abbacy of St. Peter's in Canterbury; but at the end of two years he resigned the abbacy and again went to Rome. On this occasion he returned to England with a valuable collection of books and a large number of relics, which he had accumulated during his previous visits to Rome. With these he proceeded first to Wessex with the intention of remaining there, but finding that the King of Wessex was dead he turned northwards to his native Northumbria, and there he was fortunate enough to secure the favour of King Egfrid. From him he received a donation of land at the mouth of the Wear, on which he founded the monastery of Wearmouth. In 678 he made yet another (his fourth) journey to Rome, and brought back additional stores of books for his library, as well as pictures, images, glass for windows, &c., with which he decorated the monastery he had founded. He was now presented by Egfrid with a further grant of land on the other side of the Wear, where he founded another monastery, that of Jarrow, dependent on the monastery of Wearmouth. During the remainder of his life he continued to live in the latter monastery, except on the occasion of a fifth voyage to Rome which he made in 685, and from which he derived as before valuable additions to his various collections. It is chiefly by these collections that his services to learning are to be estimated, and there can be no doubt that his great pupil the 'Venerable Bede,' who was a monk in the monastery of Jarrow, was immensely indebted to them for the learning he acquired. Benedict died in the monastery of Wearmouth, Jan. 12, 690. His life was written by Bede.

BENEDICTINES. From the sixth to the tenth century almost all the monks in the West might be so called, because they followed the rule of St. Benedict of Norcia. (See **BENEDICT (ST.)**, **MONASTERY**, and **ORDER**.) The rules which at that time the monasteries in Spain and France received from their bishops, as well as the rule of the Irish St. Columba, were essentially the same as those of St. Benedict; and in the progress of his order the monasteries in Spain and France, as well as those of the order of Columba, united themselves with it. Monte Cassino, the magnificent primitive monastery of the Benedictines, became the model of all others. At that time the monasteries, having no common superiors, were under the immediate control of the bishops in their respective dioceses, and differed from one another in many qualifications of the primitive rule. Not even the colour of their dress was the same. The disciples of Columba wore white garments like the first Benedictine nuns, who originated in France in the sixth century. After the unions which took place at a later period, all the members of this order wore black, as the founder is said to have done. The decline of monastic discipline after the eighth century occasioned the reforms of Benedict of Aniane in France, the renewed inculcation of the old rule, and the adoption of new ordinances suited to the times, by the Council of Aix-la-Chapelle (817), as well as the particular rules and fraternities of the celebrated monasteries in France, Germany, and England, which in those barbarous times became seats of civilisation

and finally the institution of the Cluniacs, a new branch of the Benedictines, which proceeded from the convent of Clugny in Burgundy, founded in the year 910. The Benedictine monasteries, in the middle ages, were often asylums in which science took refuge and found protection. In place of the discordant and uncertain rules which had hitherto existed, the Cluniacs made fixed regulations concerning the hours of worship, the obedience, discipline, and common government of all the monasteries belonging to their order, which were soon imitated in all Europe. In the twelfth century their order contained 2000 monasteries, whose luxury frequently called for reforms, and finally became the chief cause of their decline. The remains of the Cluniacs united themselves in the seventeenth century, under the patronage of Richelieu, with the Benedictine fraternities of St. Vannes and St. Maurus, the latter of which, founded in 1618, had in the beginning of the eighteenth century 180 abbeys and priories in France, and acquired by means of its learned members, such as Mabillon, Montfaucon, and Martène, merited distinction. To this family belong those new orders established on the foundation and observing the rule of St. Benedict, which have originated since the eleventh century, and are distinguished from the proper Benedictines by their dress, names, and particular regulations; for example, the Camaldulians, the monks of Valombrosa, the Sylvestrians, the Grandimontenses, the Carthusians, the Coelestines, the Cistercians and Bernardines, the Trappists, and the monks of Fontevraud (which see). The Benedictine monasteries never constituted one society, constitutionally regulated and governed under an aristocratical or monarchical form; on the contrary, a great many monasteries which descended from the old Benedictines were compelled by the Council of Trent to unite themselves gradually into particular fraternities. Among these the Benedictines of Monte Cassino, of Monte Vergine, and Monte Oliveto (who called themselves *Olivetans*) in Italy and Sicily; those of Valladolid and Montserrat in Spain; those of Hirschau and Fulda in Germany, and that of Molk in Austria, deserve particular notice on account of the extent of their possessions, the magnificence of their churches, and the mildness of their rules. To the fraternity of Molk (or Malk), which still exists, but accommodated to the spirit of the times, the rest of the Benedictine convents in Austria are joined. Many of the nunneries of this order are reserved for the nobility, because the places in them are equal to the most lucrative benefices. During the first French revolution the monasteries of the Benedictines along with all other monastic orders were abolished; but the Benedictines have since partially re-established themselves in France. In England the Benedictines were an important body at the dissolution of the monasteries, having then a hundred and eighty-six abbeys, priories, and nunneries, besides many smaller houses. They have now about a dozen institutions in this country, besides an extensive establishment at Fort Augustus in Scotland, comprising an abbey and college.

BENEDICTION signifies the same as blessing of the act of conferring a blessing. See **BLESSING**. Collections of forms of blessings compiled for the use of priests are known in the R. Catholic Church, such books generally receiving the name of *Benedictionale*. The *benediction of the blessed sacrament* is a rite in the Roman Church in which the priest, having placed the host in the monstrance, makes the sign of the cross with the latter over the people. It is a common custom for Roman Catholic ecclesiastics to give or bestow a blessing in public, with the sign of the cross, on the people. The pope gives a solemn benediction three times every year viz. on

Maundy-Thursday, on Easter, and on Ascension-day.

BENEFIT OF CLERGY, was a privilege which originated through the power of the church, and formerly in England partially or wholly exempted the clergy from the jurisdiction of the lay tribunals, leaving them to be dealt with by their bishop. It extended only to the case of felony; and though it was intended to apply only to the clergy or clerks, latterly every one who could read was considered to be a clerk, and in the time of Queen Anne the privilege was connected with a certain number of 'clergyable' offences without reference to the ability to read. A layman could only claim this privilege once, being branded on the hand with a hot iron and allowed to go; so that branding on the hand came to be simply the punishment for the first commission of a clergyable offence. Benefit of clergy was at last abolished in 1827 by 7 and 8 Geo. IV. c. xxviii.

BENEVENTO, a province of the Kingdom of Italy, with an area of 680 square miles, and a population by census of 1901 of 267,101. The surface is hilly but the soil fertile in corn, fruit, and pasture. Game is very abundant; and the Sabato, which joins the Calore from the s., teams with fish. Cattle, grain, wine, oranges, and dead game are exported. Benevento was originally called Maleventum; but this was changed to Beneventum by the Romans when they founded a colony here after the defeat of Pyrrhus. Before it came into the hands of the Romans it belonged to the country of the Samnites. The Lombards in 571 made it a dukedom, which, long after the extinction of the Lombard kingdom, remained independent. At a later period it fell into the hands of the Saracens and Normans. The city, however, was not conquered by the latter, because Henry III. had given it to the pope Leo. IX. In 1418 Benevento became part of Naples, but was given back to the pope by Ferdinand I. In 1798 it was conquered by the French, and handed over to Naples; and then in 1806 Napoleon made a present of it to his minister Talleyrand, who received thence the title of Prince of Benevento. In 1815 it was restored to the pope, and finally with Naples was annexed to the Kingdom of Italy.—The city of Benevento is situated on a hill between the rivers Sabato and Calore, is surrounded with a wall, has narrow dirty streets and some interesting buildings. Since 969 it has been the see of an archbishop. Few cities in Italy deserve so much attention on account of the antiquities which they contain as Benevento. Almost every wall consists of fragments of altars, sepulchres, columns, and entablatures. Among other things the well-preserved, magnificent triumphal arch of Trajan, built in 114, deserves particular mention. It is now called *Porta Aurea* (the golden gate), and is a gate of the city. The cathedral is a beautiful building in the Lombard-Saracenic style. Pop. 18,242.

BENEVOLENCE, the name given rather incongruously to a forced loan or contribution, by which the Kings of England were wont, without any sanction from Parliament, to levy money from their subjects. Such benevolences had been denounced by Magna Charta; and even Richard I. had allowed the only parliament of his reign to enact a statute declaring them illegal; but they still continued under some shape or other till they were finally abolished by the Bill of Rights in 1689.

BENGAL. In the widest application the name Presidency of Bengal is extended to the whole of British India, except what is under the governors of Madras and Bombay; so that it includes the provinces of Ajmir and Malwar, Coorg, and Berar, which are under the direct administration of the governor-general; the lieutenant-governorships of Bengal, the

North-West Provinces and the Panjab; the chief commissionerships of Assam, Central Provinces, and Oudh, besides various native states, &c. But the name is now usually restricted to that portion which is under the lieutenant-governor of Bengal, and which occupies the north-east of India, comprising the following divisions:—

Divisions.	No. of dists.	Area in sq. m.	Population in 1891.
Burdwan,	6	18,856	16,146,810
Presidency,	5	12,029	8,008,740
Rajshahi,	7	17,429	12,965,280
Dacca,	4	16,000	24,284,870
Chittagong,	4	12,118	2,865,020
Patna,	7	23,647	4,645,590
Bhagalpur,	5	20,492	
Orissa,	5	9,058	
Chutia Nagpur, ..	4	25,896	

Total,

The total population in 1901 amounted to 74,713,020.

The district composed of the first five of the above divisions forms the province of Bengal proper; Patna and Bhagalpur form the province of Behar. Besides these the lieutenant-generalship includes four native states under British protection, namely Cooch Behar, Hill Tipperah, Chutia Nagpur (part of), and Orissa (part of), having a total area of 37,515 square miles, and a population in 1891 of 3,428,890.

The general physical character of Bengal is that of a campaign country, there being few remarkable elevations within its limits, though it is surrounded with lofty chains of mountains; the n. part rests on the terraces of the Himalaya Mountains, the e. is bounded by the Garo or Garrows chain, and the w. is ribbed with offsets of the Vindhya Mountains. It is intersected in all directions by rivers, the principal of which are the Ganges and Brahmapootra, whose annual inundations render the soil which they reach extremely fertile. In those tracts where this advantage is not enjoyed the soil is thin, seldom exceeding a few inches in depth. The most inhospitable part of Bengal is what is called the *Sunder bunds* (from being covered with the sonndru or sunder tree), that portion of the country through which the numerous branches of the Ganges seek the sea, or the space lying between the river Hoogli and Chittagong, about 150 miles from e. to w., and about 160 from n. to s. This district is infested with tigers, is traversed in all directions by water-courses or nullahs, and interspersed with numerous sheets of stagnant water called jheels, which abound with fish and water-fowl, and are much resorted to by crocodiles.

Geology and Minerals.—In the n. part of Bengal, at the foot of the Himalayas, is a band of tertiary formation; s. from which, and along the course of the Ganges, more especially e. from that river, and including the greater part of its delta and that of the Brahmapootra, the country is wholly composed of alluvium or modern detritus. Calcutta stands upon strata of the transition series, which stretch w. into Bahar, and are flanked n. and s. by tracts of crystalline formation. In the Garo Hills coal, iron, and limestone are found; and nitre effloresces on the surface round Calcutta and elsewhere. Mineral springs are not numerous.

Rivers.—The principal rivers, besides the Ganges and Brahmapootra, the latter of which enters the province at its n.e. extremity, and falls into the Bay of Bengal near the principal embouchure of the Ganges, are the Soobunreka, which falls into the Bay of Bengal, in lat. 21° 35' n., s.w. of the Hoogli; the Coli or Coosee, which rises near Khatmandoo in Nepaul, and falls into the Ganges near Bhagulpore, in lat. 25° 20' n.; and the Damooda, which, rising in Bahar, falls into the Hoogli about 22 miles

below Calcutta. There are numerous other streams of less note, mostly tributaries of the Ganges and Brahmapootra, or their larger affluents.

Climate.—There is more regularity in the changes of the seasons in Bengal than perhaps in any other part of India; but it is subject to great extremes of heat, which, added to the humidity of its surface and the heavy dews that fall, renders it generally unhealthy to Europeans. The prevalence of hot winds, which are sometimes loaded with sandy particles, is another source of disease. The seasons are distinguished by the terms hot, cold, and rainy. The hot season continues from the beginning of March to the end of May, within which period the thermometer frequently rises to 100°, sometimes to 110°. The month of September is also often intensely hot, and when so is the most unhealthy period of the year to natives as well as Europeans, owing to the profuse exhalations from stagnant waters left by the inundations, and from a rank decaying vegetation. The rainy season commences in June, and lasts till October. During the first two months of this period the rain is frequently so heavy that 5 inches of water have fallen in one day, the annual average being from 70 to 80 inches. It is in this season that the inundations take place, and that the Ganges overflows its delta, covering the land with its waters for more than 100 miles. The cold season, the most grateful and healthy of any to Europeans, continues from November to February, during which period N. winds prevail, with a clear sky.

Forests.—In Bengal, as in India generally, great attention has been paid of late to the management of forests. Great destruction is caused among forests by fires, which are sometimes the result of accident, but more frequently made purposely by the natives in pursuance of a system of jungle cultivation that appears to prevail throughout India. This consists in cutting down and burning a patch of forest, and raising a crop in the open space, no ploughing or digging being necessary. The next year this patch is abandoned, and another treated in the same way. Another cause of destruction is the wastefulness of those who use the timber. The sundar trees, for example, which furnish the best wood for the boats which are built in great numbers throughout Eastern Bengal, have been cut down in so reckless a manner that the western parts of the Sunderbunds have already been to a large extent exhausted. In order to limit the destruction that goes on by such proceedings certain portions of the Indian forests are reserved and placed under the entire control of the government, and additions are made to these reserves every year. Of the total 11,669 square miles of forest in Bengal, in 1896 5877 were reserved and 4437 protected.

Animals.—Among the wild animals are tigers, elephants, bears, wolves, foxes, jackals, hyenas, leopards, panthers, lynxes, hares, deer, buffaloes, antelopes, and monkeys. The most formidable of all these animals (and more so even than the lion) is the tiger, which here attains its utmost size, and perhaps also its greatest ferocity. The domestic animals include native horses, thin, ill-shaped animals, and not well adapted for any kind of labour; cattle, of a very inferior breed, being extremely small and miserable-looking; sheep, likewise of diminutive size, with very coarse hairy wool, but when well fed their flesh is excellent. Hogs and goats are also plentiful, and buffaloes are domesticated for the sake of their milk. Reptiles are numerous and formidable, including gavials, a kind of crocodile, with which the larger rivers are infested; and amongst the serpent tribe, many of which are highly poisonous, the deadly cobra-de-capello. Turtles, frogs, and lizards also

abound, with swarms of mosquitoes. The turtle are chiefly procured from the island of Oheduba, in the Bay of Bengal. Fish are so exceedingly plentiful as to be within the reach of almost every class of inhabitants. Game, poultry, and water-fowl of all descriptions abound in Bengal, particularly ducks, of which there is a great variety, and most of them of a superior kind. The gigantic crane, commonly called the adjutant, from the stately air with which he struts about, frequents the towns in considerable numbers, performing the office of scavenger by clearing the streets of garbage, in consideration of which duty he enjoys an entire immunity from all disturbance; his principal food is offal, toads, lizards, serpents, and insects. Crows, kites, sparrows, and other small birds are numerous.

Agriculture.—The staple crop of Bengal is rice, which is cultivated so as to produce three harvests in the year—spring rice, autumn rice, and winter rice. The last of these harvests is by far the most important. Besides sufficing for the wants of the population the rice crop leaves a large surplus for exportation. Oil-seeds are also largely cultivated, chiefly mustard, sesamum, and linseed. The jute plant (*pad*) has long been cultivated, and in recent times the cultivation of it has greatly extended. It will grow on almost any description of land; is sown generally in May, and cut down in August and September. It attains to a height of 5 or 6 feet, and after being cut is steeped in water for about ten days, when it is reduced to a substance like hemp. Part of this crop is cultivated by those who use or manufacture it, almost all the Hindoo farmers weaving cloth from it. It is now manufactured also in large mills under European management, and jute goods are now an export of some importance, though not nearly so much so as jute in the raw state for manufacture in Europe. The sunn-plait, a plant somewhat resembling the Spanish broom, is now pretty extensively cultivated and exported to Great Britain, affording excellent material for both sails and cordage, and being made into fishing-nets by the natives. Cotton is grown over all India, but the best of the herbaceous kind is raised in Bengal and on the Coromandel coast; the finest grows on light rocky soil. The cotton seed is sown in the latter end of October, and is gathered between the middle of April and the middle of June, the produce varying from 500 to about 800 lbs an acre. In the absence of rain the cotton field is watered every eight or twelve days, four men watering about an acre a day. The cotton of India is generally inferior to that of America; but this is believed to be wholly owing to careless cultivation, and to the slovenly manner in which it is prepared for the market. The cultivation of the date-palm and the manufacture of date-sugar are carried on to a considerable extent, forming a profitable business for the cultivator. This kind of sugar forms an article of export. The sugar-cane is cultivated, but not nearly to such an extent as might be expected. There are two kinds of sugar-cane, the one a yellow hard cane, about the thickness of a finger; the other is much thicker and deeply stained with purple. The latter is the most productive, but the most troublesome to cultivate, and therefore avoided by the most indolent farmers—the land on which it is grown requiring ten or twelve double ploughings, and a great deal of manure. The cuttings, about a foot in length, are planted in February and March, and the plants are cut between the middle of December and the end of the following March. One mill, and one set of implements used in insipiating the juice, usually serve for several farms. The mill and implements generally belong to some wealthy man, who lets them out

on hire. Tobacco, which requires a light soil, is grown in three different situations—in rich spots of land contiguous to the farmer's house—in high land suitable for the growth of sugar-cane, and often alternating with that crop—and on the banks of rivers. The betel-leaf, famous for its intoxicating quality, and largely used over all India on that account, is cultivated in what is called a *vory* or fort, and is carefully protected from the sun and wind. A betel garden lasts from twelve to thirty years, yielding the best return of any land in Bengal. Indigo being one of the principal articles of foreign commerce with Bengal, is extensively cultivated in that province. It is, however, a very uncertain crop, and both the soils chosen for it and the seasons for sowing it are various. It is remarkable that the produce of indigo in Bengal has not increased in any degree for the last thirty years. The opium production of Bengal was a government monopoly under Mohammedan rule, and has been retained as such by the British. All the juice of the opium poppy must be sold to the government at a fixed price. This cultivation is carried on in the west of Bengal in the divisions of Chota Nagpur and Patna. Orchards of mango-trees are to be found in every part of Bengal, the fruit being in general demand during the hot months. The cinchona-tree and the tea-plant have both in recent times been added to the agricultural products of Bengal; the former in the native state of Sikkim, the latter especially in Cooch Behar (Darjiling), Chittagong, and Chota Nagpur. The field for the expansion of this cultivation is said to be indefinitely large in Darjiling, a large part of which seems to have a better soil for the plant than any yet explored.

The luxuriance of vegetation in Bengal is perhaps unequalled in any other part of the world. The cultivation of the land requires little effort, and large crops are obtained without the application of any other manure than the sediment or mud deposited by the inundations. It is doubtful, however, how far this facility is good, since it seems to have had the effect of preventing all attempts at improvement either in the science of agriculture itself or in the implements used in its practice. The Indian plough is of wretched construction, having neither coulter nor mould board, and in some districts it wants even the share, while the animals by which it is dragged, two oxen or cows, are miserable half-starved creatures. The reaping hook (*kastyā*) is a most inefficient implement—the curved or cutting part of the blade is 6 inches long by 1½ broad, with teeth like a saw—the handle is about 4½ inches long. The *dengk*, by which the husks are separated from the grain, is another wretched implement, and so ill adapted to its purposes that one-fifth part of the whole grain is sacrificed in the operation. Nearly all the other implements in use are of an equally rude and imperfect description. Rotation of crops and the use of fallows are unknown to the farmers of India; the land is generally in an exhausted condition, and the inclosures everywhere bad. Grain is trodden out by oxen, and stacking corn is unusual, the corn being often left exposed to the weather. Irrigation, however, is well understood—necessity giving rise to invention—and is accomplished by the most ingenious and efficient means. The land is mostly held by zemindars, who pay a fixed revenue direct to government; but it is largely occupied by sub-tenants. Farms are generally small, varying from 1 to 20 acres, and the farmers are most of them miserably poor.

Manufactures.—The principal manufacture of Bengal is that of cotton goods, including cotton

piece-goods of various descriptions, calicoes, thread, and sail-cloth. Muslins of the most beautiful and delicate texture were formerly made at Dacca, a city in this province, but the manufacture is almost extinct. 'Some of these fabrics,' says Tavernier, 'were so fine that they could hardly be felt in the hand, and the thread when spun was scarce discernible.' In Ward's History, &c., of the Hindus this character of the muslin of Dacca is confirmed; though perhaps in both cases it is a little exaggerated. 'When this muslin is laid on the grass,' says the latter, 'and the dew has fallen upon it, it is no longer discernible.' In the hyperbolic but poetical language of the East these delicate airy fabrics were designated as 'webs of woven wind.' The extraordinary fineness and beauty of India muslins, manufactured under the disadvantages of rude machinery and ill-prepared material, is attributed to the exquisitely fine sense of touch possessed by the Hindus, and to the hereditary continuance of a particular species of manufacture in families through many generations. The delicate formation and flexibility of their fingers is equally remarkable. The decay of the muslin manufactures of India has been owing in a great measure to the successful competition of Great Britain, and to the circumstance of British fabrics being subject to no duty in Bengal, while high duties were levied on the fabrics of Bengal in Britain. These duties are now abolished. Large quantities of a coarse cloth, manufactured from jute, are made in various districts of Bengal. Sericulture is carried on more largely in Bengal than in any other part of India, and silk-weaving is still a leading industry in many of the districts; but of late years there has been a serious decline in both the culture and weaving of silk. One branch of this industry, however, seems now flourishing than some others, namely, the cultivation of *tasar* or wild silk the worm that produces which feeding upon the leaves of the sal and other forest trees. On the other hand, various new manufactures, carried on by machinery, are rising up. The most important of these are the industries connected with jute, cotton, and sugar. These are already affording employment to many thousands, and the natives are said to show great aptitude for factory work. The jute mills alone employ nearly 40,000 hands. As already mentioned, a considerable quantity of sugar is made from the juice of the date-tree and from the sugar-cane; and in Orissa the principal manufacture is that of salt.

Commerce.—The commerce of Bengal, both internal and external, is very large. Multitudes of native boats and other craft navigate the rivers. The imports to Calcutta from the interior have been valued at over £26,000,000, consisting of rice, tea, jute, indigo, linseed, mustard-seed, wheat, &c. The foreign trade is large and increasing. Almost the whole of it passes through Calcutta, and the value of it annually is over £55,000,000, over £34,000,000 being exports. The most important exports are opium, jute, indigo, oil-seeds, ten, hides and skins, and rice: the chief import is cotton piece goods. The foreign trade is chiefly with Britain, China, the Straits Settlements, France, the United States, and Ceylon.

Finance.—The total revenue of the Lieutenant-governorship of Bengal in the year ending 31st March, 1898, was (calling the rupee 2s.) £20,268,498, and the total expenditure £10,824,108. The surplus goes to meet the expenses of the general government of India. The principal sources of revenue are land (amounting in 1897-98 to £3,978,219), salt (£2,451,384), opium (£1,824,840), excise (£1,274,778), stamps (£1,775,941), and customs, assessed taxes, &c.

Education, Social and Domestic Condition, &c.—

It is one of the consequences of the extreme poverty of the bulk of the population of Bengal, that education should be there at a very low ebb. The proportion of boys of school-going age attending school is only about 28·6 per cent. of girls 2 per cent. The first rudiments of education are often given in small schools called *pathshalas*, in which the fees are extremely low, and in which only reading, writing, and arithmetic are taught. The greater number of these, although private establishments, receive aid from government. In the primary schools the principle of keeping the standard of instruction as low as possible is adhered to; and this is intended to be done until the whole of the poorest classes shall have been brought under some kind of instruction. In the meanwhile, all who have time or means for learning more are encouraged to resort to schools of a better class. With this view a system of intermediate schools was established in 1875 between the primary and what are called the middle schools, and this step has been rewarded with a satisfactory measure of success. Besides the schools already mentioned there are various educational institutions of a higher kind connected with government. The highest of these institutions is the Calcutta University, with the four faculties of arts, law, medicine, and engineering. Affiliated to the university are a number of general and professional colleges, in one of which all who have passed the university entrance examination and wish to proceed to a degree must enrol themselves. The majority of educated Bengal youths, according to official information, resort to two professions, the public service and the law, in consequence of which many cannot obtain employment. With a view to open out other lines of employment the government is endeavouring to establish technical and industrial schools of a superior kind in many places. A healthy ambition is said to exist among the natives of Bengal to raise themselves by education. Almost every Bengalee youth who can afford the means aspires to an English education as one of the main objects of his life. One result of the Prince of Wales's visit to Bengal at the end of 1875 was that the wealthier natives raised subscriptions to commemorate the event by founding educational institutions. The secondary schools are generally divided into 'English' and vernacular. Those in which English forms part of the regular course of study of all the scholars, or at least of all in the higher classes, are reckoned as English; if English is optional only, they are reckoned as vernacular. In the common languages of the country there were till lately almost no books to be had; but the Bible, or parts of it, has now been printed in the various languages and widely circulated, as well as a number of other works.

The private houses of Bengal are huts, with pent-roofs, constructed of two sloping sides which meet in a ridge. One hut of this kind serves the poor man for himself, family, and cattle; wealthy men increase the number of houses without altering the plan, and without having any communication between the different apartments. The walls are generally made of mud, and the floor is raised a foot or two above the level of the plain, to prevent its being flooded in the rainy season, which, however, is not always accomplished. The frames of the houses consist of bamboos tied together—wooden posts and beams being used in the construction of the houses of the wealthy only. The huts collectively sufficient for the accommodation of a family are usually surrounded by a common fence. Farmers have in general larger and better houses than people living in towns. A rich farmer will sometimes have as many as twelve or fourteen huts within his inclosure. The food of the class just above the rank of common labourers consists

chiefly of rice, wheaten flour, fish, vegetables, and butter, with various condiments and seasonings. In the case of the labourer there is neither flour, fish, vegetables, nor butter, the chief food of that class being a coarse description of rice.

History.—The English first got a firm footing in Bengal about 1644, when, through the influence of an English medical man named Boughton, a favourite of the Emperor of Delhi, the East India Company obtained permission to locate themselves at Hugli or Hoogly, some 28 miles above Calcutta. In 1686 the Company's factors, having had a rupture with the Moslem commander at the place where they were located, removed to Calcutta, then the village of Chut-tanuty, where they continued to carry on their trade. In 1700 the Viceroy of Bengal, being in want of money to dispute the succession to the Mogul throne, obtained a large sum from the Company for the township on which their factory stood at Calcutta, and some adjacent lands. Seven years afterwards, namely in 1707, Calcutta was erected into a presidency, and the foundation of British power in India laid—presenting a striking proof of the superior energy of the British character, there having been settlements in India by the Portuguese, Dutch, French, and Danes, previous to, and contemporary with, the location of the English in that quarter of the world; but the mighty achievement of obtaining the supremacy in that vast empire could, it appears, be accomplished only by the British. For nearly half a century the Company pursued a peaceful and profitable commerce; but at the expiry of that period, 1756, Calcutta was attacked and taken by the Subahdar of Bengal, who threw the Englishmen he found there, 147 in number, into a dungeon, the well-known *black hole* of Calcutta, where 123 of them perished in eleven hours. In the ensuing year Calcutta was retaken by Lord Clive—an event which was followed by a series of victories on the part of the British that terminated in the entire conquest of India. In consequence of unprecedented drought great scarcity of food prevailed in 1873 and 1874, but the prompt measures of the government were sufficient to prevent any wide-spread mortality. A bill conferring upon agricultural tenants a transferable interest in their holdings and protecting them against eviction was passed in 1885.

BEN-GAZI, a town in North Africa, capital of the vilayet Barca, on the E. coast of the Gulf of Sidrah. Next to Tripoli it is the most important seaport on this coast. The harbour is fast becoming sanded up, and admits only small vessels; but there is still a considerable trade, cattle, corn, &c., being exported, especially to Malta. Pop. 18,000.

BENGEL, JOHN ALBANUS, a famous German theologian, born in 1687 at Winnenden in Württemberg, studied at Stuttgart and Tübingen, and in 1718 became a preacher and professor at Denkendorf. His chief studies were the fathers of the church and the New Testament. He died, after having been appointed to several offices, in 1752. Bengel was the first Lutheran theologian who applied to the criticism of the New Testament a comprehensive spirit, which embraced the subject in its whole extent, and manifested the power of patient investigation which the study required. His suggestions for the correction of the text are particularly valuable.

BENGER, ELIZABETH OHLIVT, an historical authoress of some note, was the daughter of a purser in the navy, and born at Wells, Somersetshire, in 1778. She early displayed a turn for literature, but her straitened means preventing her from gratifying this taste by the purchase of books, she was in the habit of perusing the opened books in a bookseller's window, and would return day after day to see if the page had been turned over. In 1802 she removed with

her mother to London. Her first literary attempts, including a poem on the abolition of the slave-trade and two novels, attracted little attention; but she was more successful with her *Memoirs of Mary Queen of Scots*, and of *Elizabeth Queen of Bohemia*. She also wrote the *Lives of Anne Boleyn*, *Mrs. Elizabeth Hamilton*, and *John Tobin*, the dramatist. Miss Benger's chief merits are the clearness of her style and her industry in the collection and arrangements of facts. She died in 1827.

BENGUELA, or **BENGUELLA**, a district belonging to the Portuguese on the w. coast of South Africa, forming one of the three provinces of Angola; bounded n. by the province of Loanda, s. by that of Mossamedes, and w. by the Atlantic Ocean. The interior of the country is mountainous, the direction of the elevated lands being from n.e. to s.w. It is well watered, being intersected by numerous rivers and streams. Its vegetation is luxuriant, and it possesses extensive forests. Its products are those of tropical Africa generally. Coffee grows wild. The soil in parts is well adapted for the production of grain; but little is grown. The larger animals of Africa are numerous, such as lions, elephants, and hippopotami. The minerals include copper, sulphur, lead, gold, and silver. The only town worth mention is the seaport, Benguela, which is pleasantly situated and fairly healthy. It exports rubber, coffee, skins, ivory, &c. A short railway starts from the town, the population of which is about 8000. The population of the province may amount to several millions.

BENHADAD, the name of three kings of Syria. They are all mentioned in Scripture; but the most conspicuous is the second, who was equally remarkable for his arrogance in prosperity and his craven spirit in adversity. He first sent an insolent message to Ahab, claiming himself and all his subjects as his slaves; and after Ahab encountered and defeated him, Benhadad sent a message abjectly begging his life. Ahab was impolitic enough to grant it, and Benhadad, disregarding all his promises, proved a bitter and formidable enemy to his successor. He was at last murdered by his captain, Hazael, about B.C. 890.

BENI, a river of South America, formed by the junction of several streams flowing eastwards from the Andes in about 18° s. Its course is north and north-east through Bolivia; and on the border of Brazil it unites with the Mamore to form the Madeira, by which its waters are carried to the Amazon. It receives several tributaries of importance, the chief being the *Madro de Dios* from Peru, and it is navigable throughout a great part of its course. Its length is about 850 miles.

BENICARLO, a seaport of Spain, in Valencia, in the province of Castellon, surrounded with walls, having an old castle, a fine church, and some manufactures, &c. It is chiefly noted as being the place of export of the red wines called by its name which are produced in the surrounding country. These are chiefly sent to Bordeaux to be mixed with clarets, or to England to be manufactured into port. Pop. (1897), 7160.

BENI-HASSAN, a village of middle Egypt, on the east bank of the Nile, remarkable for the grottoes or catacombs in the neighbourhood, supposed to have formed a necropolis for the chief families of a city, Hermopolis, on the opposite bank, and exhibiting interesting paintings, &c.

BENI-ISRAEL, a race in the west of India (the Konkan seaboard, Bombay, &c.) who keep a tradition of Jewish origin, and whose religion is a modified form of Judaism. They are supposed to be a remnant of the ten tribes.

BENI-MZAB, a race or tribe of Berbers that

dwelt in the Sahara, near its northern border, and recognize the supremacy of the French. They number some 60,000, of whom about 15,000 are in the town of Ghardaya. They are peacefully disposed, and numbers of them are employed in various occupations.

BENIN, a negro country or kingdom of West Africa, on the Bight of Benin, extending along the coast on both sides of the Benue River, and to some distance inland, and now included in the British territory of Southern Nigeria. The chief town is Benin, about 60 miles inland, a trading centre with a British resident and staff, and 40,000 or 50,000 inhabitants. It was taken in 1897, and its king was captured and banished, a British mission on its way to the place having been treacherously massacred. The coast is indented with estuaries, some of them of considerable breadth, and studded with islands. The country is flat for some distance inland, when it begins gradually to rise, till it attains a height of over 2000 feet. It is very well wooded, and being likewise well watered, it is rich in all the vegetable productions of the tropics. Cotton is indigenous, and is woven into cloth by the women. Sugar-cane of good quality is grown; and yams, plantains, maize, rice, &c., are cultivated. The religion is Fetichism. The climate, especially at the mouths of the rivers, is very unhealthy. There is a considerable trade in palm-oil and other products.

BENIN, **BIGHT OF**, a large bay of West Africa, forming a portion of the Gulf of Guinea, and extending from the Niger delta westwards to about the river Volta.

BENI-SUEF, the capital of a province of the same name in Egypt, is pleasantly situated on the left bank of the Nile, 70 miles s. from Cairo, with which it is connected by railway. It is the entrepôt for the produce of the Fayoum, and contains cotton mills and alabaster quarries. Pop. 10,085.

BENJAMIN OF TUDELA, born at Tudela, in Navarre, in the twelfth century, is chiefly known by his travels over large portions of Europe, Palestine, Mesopotamia, the East Indies, and Ethiopia. As the first European traveller who penetrated far into the East, he furnishes a great amount of interesting information, and though not free from error or fallacy, proves himself worthy of the high estimation in which he has always been held among his Jewish countrymen for soundness of judgment and extent of learning. His *Itinerary*, first printed in Hebrew at Constantinople in 1543, has been translated into many languages. The edition of Asher (London and Berlin, 1840-41) contains an English translation.

BENLAWERS, a huge pyramidal mountain of Scotland, Perthshire, on the n. bank of Loch Tay, 3984 feet above the level of the sea, or 4004 with the cairn at the top. Many rare Alpine mosses and other plants are found on it.

BENLEDI, a Scottish mountain, lying n.w. of Callander, Perthshire, reaching the height of 2875 feet above sea-level. It is somewhat difficult of ascent, but gives a splendid view. High up on it there is a small loch.

BENLOMOND, a Scottish mountain at the western extremity of Stirlingshire, on the s. shore of Loch Lomond. The ascent is divided into three great stages, and the top has an elevation of 3192 feet above sea-level. On the south-eastern side it presents a sheer precipice of about 2000 feet. From the hotel at Rowardennan, on the s. shore of the loch, to the summit, the distance is 4 miles, which may be accomplished on foot or on pony-back. The lower part of this mountainous cluster is well wooded, and the upper regions afford excellent

beathy pasture. It commands a most extensive prospect of the vale of Stirlingshire, the Lothians, the Clyde, Ayrshire, Isle of Man, hills of Antrim, and all the surrounding Highland territory. Like Benlawers this is one of the botanical gardens of the Highlands.

BENMORE (the great mountain), a conical hill betwixt Loch Dochart and Loch Voil, western part of Perthshire, among the Braes of Balquhider. It rises to an elevation of 3843 feet above the level of the sea. Several other hills bear this name.

BEN-MUICH-DHUI, or **BEN-MAC-DHUI**, the second highest mountain in Scotland, is situated in the south-west corner of Aberdeenshire, on the borders of Banffshire. It is a granitic mass, rising to the height of 4296 feet, and forms one of a cluster of lofty mountains, among which are Brae-risach, Cairn-toul, Cairngorm, Ben-a-bourd, and Ben-A'an. Its upper parts are bare of vegetation. The view from the top includes the Moray Firth, the hills of Caithness and Sutherland, Bennewis, Benmore, &c.

BENNEVIS, now ascertained to be the most lofty mountain in Great Britain, is situated in the south-western extremity of Inverness-shire, immediately N. of Fort-William and the opening of the Caledonian Canal into Loch Eil. It rises from the brink of the latter piece of water to the height of 4406 feet. In clear weather a view can be obtained from its summit athwart nearly the whole of the N. of Scotland from sea to sea. It consists principally of a fine brown porphyry, and contains red granite of a beautiful grain. It has some very lofty precipices, and in its fissures the snow remains unmelted, even in the warmest weather. An observatory occupied by a resident staff was established on the top of the mountain by the Scottish Meteorological Society in 1883.

BENNINGSSEN, **LEVIN AUGUSTUS**, **BARON VON**, Russian commander-in-chief, born at Brunswick in 1745, early entered into the Russian service, and distinguished himself by his bravery in the war against Poland, under the Empress Catherine II. In 1806 he was appointed to command the Russian army which hastened to the assistance of the Prussians. He afterwards fought the murderous battle of Eylau, and the battle of Friedland. After the peace of Tilsit he retired to his estates. In 1813 he led a Russian army, called the 'army of Poland,' into Saxony, took part in the battle of Leipzig, and blockaded Hamburg. After commanding the army in the N. of Russia, he finally settled in his native country, and died Oct. 3, 1826. He is the author of *Thoughts on Certain Points requisite for an Officer of Light Cavalry to be Acquainted with* (Riga, 1794; Wilna, 1805).

BENNINGTON, a town in Vermont, U. States, situated in a good grazing country, and possessing considerable trade and manufactures. On Mount Anthony in this town there is a cave containing many beautiful petrifications. Two important battles were fought here on the 16th of August, 1777, in both of which General Stark at the head of 1600 American militia was victorious over the British. Pop (1890), 6391.

BENNO, **St.**, of the family of the Counts of Woldenberg, born at Hildesheim in 1010, became (1023) a Benedictine monk in the convent of St. Michael there. Henry IV. (1086) made him Bishop of Minden (Meissen), and favoured him by repeated donations of estates for his church. Nevertheless Benno took a secret part in the conspiracy of the Saxon nobles against the emperor, for which reason Henry led him away prisoner when he passed Minden, in 1075, after the battle on the Unstrut. He was afterwards set at liberty, but several times proved

faithless to the emperor. He died 1107. His bones began by degrees to work miracles; and Pope Adrian VI., after many entreaties from the Saxons, as well as from the Emperor Charles V., and having received large sums of money, placed him among the saints. It was thought that this canonization would tend to the promotion of the Catholic faith in Saxony. At present the bones of St. Benno are in the city of Munich, which has chosen him for its patron.

BENNOZO, **GOZZOLI**, a celebrated painter, born in 1400, became the pupil of Giovanni di Fiesole, and the imitator of Masaccio, and soon placed himself at the head of all his contemporaries. He excelled particularly in the representation of splendid edifices, landscapes, animals, and scenes of animation and gaiety. After visiting Rome he settled at Pisa, where his finest pieces are seen. The most celebrated, the *Discussion with the Doctors*, is one of the principal ornaments of the cathedral.

BENSERADE, **ISAAC DE**, a poet at the court of Louis XIV., born 1612, at Lyons-la-Forêt, a small town in Normandy, wrote for the stage, and composed a great number of ingenious verses for the king and many distinguished persons at court. In the first half of the reign of Louis XIV. the court, and the followers of the court, patronized songs of gallantry, rondeaux, triosets, madrigals, and sonnets, containing sallies of wit, conceits, and effusions of gallantry in the affected style then prevalent. No one succeeded so well in this art as Benserade, who was therefore called by way of eminence *le poète de la cour*. He received many pensions for his performances, and lived at great expense. Wearing at last with the life which he led at court he retired to his country-seat, Gentilly, and died 1691.

BENSHI, or **BANSHEE**, an Irish word meaning female fairy, applied to a sprite or fairy said to attach itself to a particular family, and to appear before the death of any of its members. It was considered rather an aristocratic distinction for any family to have a banshee attached to it, and in the 18th century every great family in Ireland boasted of that distinction. The Irish banshee is said always to have appeared as a woman, sometimes old and hideous, but sometimes also young and even handsome. Similar superstitions were at one time current with regard to different families in England and Scotland, sometimes a dove being the omen of death, sometimes the wailing as of a woman in distress, and so on.

BENTHAM, **JEREMY**, a distinguished writer on politics and jurisprudence, was born in 1749. He studied English law, but never appeared at the bar, being enabled by easy circumstances to devote himself entirely to literary compositions. He did not, however, publish his chief works himself. They were arranged and translated into French by his friend M. Dumont, and printed partly in Paris and partly in London. Among them are *Traité de Législation, Civile et Pénale*, &c. (Paris, 1802, three vols.), and *Théorie des Peines et des Récompenses* (London, 1801, two vols.). Bentham advocated a thorough correction of civil and criminal legislation. His *Fragments on Government*, in opposition to Blackstone, appeared anonymously in 1776, and with his name, London, 1823. In France his literary labours found a better reception than in England or Germany. A small pamphlet on the liberty of the press (London, 1821) was addressed by him to the Spanish Cortes during their discussion of this subject; and in another (*Three Tracts relative to the Spanish and Portuguese Affairs*, London, 1821) he refuted the idea of the necessity of a house of peers in Spain, as well as Montesquieu's proposition that judicial forms are the defence of innocence. One of his latest works

was the *Art of Packing* (London, 1821), that is, of arranging juries so as to obtain any verdict desired. His previous work, *Essai sur la Tactique des Assemblées Législatives*, edited from the author's papers by Étienne Dumont (Geneva, 1816), and translated into German, contains many useful observations. His *Introduction to the Principles of Morals and Legislation* (London, 1823, two vols.) treats of the principal objects of government in a profound and comprehensive manner. Zanolli has translated Bentham's *Theory of Legal Evidence* into Italian (Bergamo, 1824, two vols.) Among the earlier works of Bentham was his *Defence of Usury*, showing the Impolicy of the Present Legal Restraints on the Terms of Pecuniary Bargains (1787). Mr. Bentham died in London, June 8th, 1832, leaving his body to be dissected for the benefit of science. A complete edition of his works, with a biography by Bowring, was published in London (eleven vols. 1843). He was a man of primitive manners, unblemished character, and undoubted earnestness in the cause of the people at large. He is considered the father of the Utilitarians, or those moral political economists who view everything as it is affected by the principle of 'the greatest happiness of the greatest number.'

BENTINCK, LORD WILLIAM CHARLES CAVENDISH, second son of the third Duke of Portland, was born in 1774, and entered the army at an early age. He served in the Duke of York's campaign in Flanders, and also in Italy with the Russian army under Suwaroff, from 1799 to 1801. In 1803 he proceeded to India as Governor of Madras, returned from thence in 1805, and subsequently went to Spain, where he commanded a brigade under Sir John Moore at Corunna. In 1810 he visited Sicily as British plenipotentiary, and commander-in-chief of the English troops. The most noticeable feature of this expedition is his bestowment on the Sicilians of a constitution, which, however, was overturned on the restoration of the Bourbons. He conducted in 1818 the expedition from Sicily to Catalonia, and in 1814 took possession of Genoa on the revolt of the inhabitants from French rule. The same year he returned to England, and subsequently entered Parliament as member for Nottingham. In 1827, under Mr. Canning's administration, he was sent to India as governor-general, and held that office till 1835, when he returned to England. Among the principal events of his administration are the abolition of the practice of suttee, the repeal of the restrictions which prohibited all Europeans, except servants of the Company, from settling in India, and the recognition of the liberty of the press. In 1836 he again entered Parliament as member for the city of Glasgow, but was now unable from ill health to take any active share in political matters. He died at Paris on 17th June, 1839.

BENTINCK, LORD WILLIAM GEORGE FREDERICK CAVENDISH, generally known as Lord George Bentinck, was the son of William Henry Cavendish, fourth Duke of Portland, and born on 27th Feb. 1802. He entered the army, but quitted it early to become private secretary to Mr. Canning, who had married his mother's sister. In 1827 he entered Parliament as member for King's Lynn, and continued to represent that borough for the rest of his life. Up to 1846 he was a warm adherent of Sir Robert Peel and his measures; but on the latter announcing himself in that year a convert to free-trade principles, Lord George abandoned his old ally, and came forward as the zealous and indefatigable leader of the Protectionists in the House of Commons. With the assistance of Mr. Disraeli he maintained this position for two years, and though often illogical, and sometimes unscrupulous in his state-

ments, he nevertheless commanded much attention by the vigour and earnestness of his oratory and deportment. He died Sept. 21, 1848.

BENTIVOGLIO, CORRADO, cardinal and poet, born at Ferrara, 1668, of a family that held the highest offices in the former Republic of Bologna. He early distinguished himself by his progress in the fine arts, literature, philosophy, theology, and jurisprudence. While at Ferrara he patronised the literary institutions there. Pope Clement XI. made him his domestic prelate and secretary to the apostolic chamber, and sent him, in 1712, as nuncio to Paris, where, during the last years of the reign of Louis XIV., he acted an important part in the affair of the bull *Unigenitus*. The Duke of Orleans, regent after the death of Louis, was not favourably disposed towards him; the pope therefore transferred him to Ferrara, and in 1719 bestowed on him the hat of a cardinal, and employed him at first in Rome, near his own person, then as legate *à latere* in Romagna, &c. Bentivoglio died in Rome, 1732. Poetry had occupied the leisure hours of the learned cardinal. Some sonnets composed by him are to be found in Gobbi's Collection, vol. iii., and in other collections of his time. Under the name of Salvaggio Porpora, he translated the *Thebais* of Statius into Italian.

BENTIVOGLIO, GUY or GUIDO, celebrated as a cardinal and an historian, was born at Ferrara in 1579. He studied at Padua with great reputation, and afterwards, fixing his residence at Rome, acquired general esteem by his prudence and integrity. He was nuncio in Flanders from 1607 to 1616, and afterwards in France till 1621. His character stood so high, that, on the death of Urban VIII. in 1644, he was generally thought to be the most likely person to succeed him; but on entering the conclave in the hottest and most unhealthy season of the year, he was seized with a fever, of which he died, aged sixty-five years. Cardinal Bentivoglio was an able politician, and his historical memoirs are such as we should expect from such a man. The most valuable of these are his *History of the Civil Wars in Flanders*, written in Italian, and first published at Cologne, 1630, a translation of which, by Henry, earl of Monmouth, appeared in 1654 (London, folio); his own *Memoirs*, and a collection of letters which are reckoned among the best specimens of epistolary writing in the Italian language (an edition of which was published at Cambridge in 1727).

BENTLEY, RICHARD, a celebrated English divine and classical scholar, distinguished as a polemical writer in the latter part of the seventeenth century, was born near Wakefield, in Yorkshire, in 1662. His father is said to have been a blacksmith. To his mother, who was a woman of strong natural abilities, he was indebted for the first rudiments of his education. At the age of fourteen he entered St. John's College, Cambridge. In 1682 he left the university, and became usher of a school at Spalding; and this situation he relinquished in the following year for that of tutor to the son of Dr. Stillingfleet, Dean of St. Paul's. He accompanied his pupil to Oxford, where he availed himself of the literary treasures of the Bodleian Library in the prosecution of his studies. In 1684 he took the degree of A.M. at Cambridge, and in 1689 obtained the same honour at the sister university. His first published work was a Latin epistle to Dr. John Mill, on an edition of the *Chronicle* of John Malela, which appeared in 1691. It contained observations on the writings of that Greek historian, and displayed so much profound learning and critical acumen as excited the sanguine anticipations of classical scholars from the future labours of the author. Dr. Stillingfleet, having been

raised to the bishopric of Worcester, made Bentley his chaplain, and in 1692 collated him to a prebend in his cathedral. The recommendation of his patron, and of Bishop Lloyd, procured him the honour of being chosen the first preacher of the lecture instituted by the celebrated Robert Boyle for the defence of Christianity. The discourses against atheism which he delivered on this occasion were published in 1694; they have since been often reprinted, and translated into several foreign languages.

In 1693 he was appointed keeper of the royal library at St. James—a circumstance which incidentally led to his famous controversy with the Hon. Charles Boyle, afterwards Earl of Orrery, relative to the genuineness of the Greek Epistles of Phalaris, an edition of which was published by the latter, then a student at Christ Church, Oxford. In this dispute Bentley was completely victorious, though opposed by the greatest wits and critics of the age, including Pope, Swift, Garth, Atterbury, Aldrich, Dodwell, and Conyers Middleton, who advocated the opinion of Boyle with a degree of warmth and illiberality which appears very extraordinary. In 1699 Bentley, who had three years before been created D.D., published his Dissertation on the Epistles of Phalaris, in which he satisfactorily proved that they were not the compositions of the tyrant of Agrigentum, who lived more than five centuries before the Christian era, but were written by some sophist under the borrowed name of Phalaris, in the declining age of Greek literature.

Soon after this publication, Dr. Bentley was presented by the crown to the mastership of Trinity College, Cambridge, worth nearly £1000 a year. He now resigned the prebend of Worcester, and in 1701 was collated to the archdeaconry of Ely. His conduct as head of the college gave rise to accusations against him from the vice-master and some of the fellows, who, among various offences, charged him with embezzling the college money. The contest was much protracted and occasioned a law-suit which, after lasting more than twenty years, was decided against him, a sentence being passed depriving him of his mastership; but this sentence his opponents were never able to carry out, being always baffled by Bentley's superior skill and mastery of legal forms. In 1711 he published an edition of Horace at Cambridge in 4to, which was reprinted at Amsterdam; and in 1713 appeared his remarks on Collins's Discourse on Free-thinking, under the form of a Letter to F. H. [Francis Hare], D.D., by Phileleutherus Lipsiensis. He was appointed regius professor of divinity in 1716, and in the same year issued proposals for a new edition of the Greek Testament, an undertaking for which he was admirably qualified, but which he was prevented from executing in consequence of the animadversions of his determined adversary, Middleton. In 1726 he published an edition of Terence and Phædrus; and his notes on the comedies of the former involved him in a dispute with Bishop Hare on the metres of Terence which provoked the sarcastic observation of Sir Isaac Newton, that 'two dignified clergymen, instead of minding their duty, had fallen out about a play-book'. The last work of Dr. Bentley was an edition of Milton's Paradise Lost, with conjectural emendations, which appeared in 1732. This added nothing to his reputation, and may, in one word, be characterized as a failure. He died at the master's lodge at Trinity, July 14, 1742, and was interred in the college chapel. As a scholar and a critic Bentley holds the highest position. The best informed of his opponents respected his talents while they were loading him with classical abuse, which he did not fail to return with interest. Now that the animadversions excited

apparently by his personal conduct, have subsided, his pre-eminence in that species of literature which he cultivated is universally acknowledged, though no one work of his does justice to his greatness. The German scholar, J. A. Wolf, wrote an excellent biography of Bentley; and an English biography of him was written by Monk (London, 2 vols., 1838). See also Prof. Jebb's monograph in the English Men of Letters Series (1882).

BENUWE, **BENUA**, or **BURU**, a river of West Africa, the chief tributary of the Niger. It rises in the Bub'n Jidda hills on the east of Adamawa, flows for a short distance north-west, then west to Bassama, after which its course is generally south-west to its junction with the Niger at Lokoja. Its length is about 850 miles. The source of the Benuwe was long unknown. Dr. Barth, who came upon the river in 1851, while travelling in Adamawa, near the confluence of the Faro, which joins it on its left bank about lat. 12° 30' N., was told that it came from the S.E. a distance of nine days' journey. In consequence of this discovery an expedition was fitted out by the British government for the purpose of exploring the Niger from its mouth upwards. The exploration was made in a small steamer called the *Pleiad*, and was under the command of Dr. William Balfour Baikie. After reaching the point of confluence of the Benuwe with the Niger, about lat. 7° 40' N., Dr. Baikie followed the former eastward for a direct distance of about 370 miles. The point thus reached was about lat. 9° 25' N.; lon. 11° 30' E. There was sufficient depth of water, though the river was only rising, to allow a still further exploration. The natives, however, had begun to display their hostility in such a manner as made it necessary to return. The result was to show that a large, fertile, and populous tract of a region of Africa previously in a great measure unknown, was accessible by means of a navigable river. A second expedition, also under Dr. Baikie, explored the same river in 1857. In 1879 a small steamer belonging to the Church Missionary Society went up the river 140 miles, and its source was discovered by Fliegel in 1883.

BENWYVIS, or **BEN UAISH**, a mountain of Scotland, in Ross-shire, about 8 miles to the north-west of Dingwall. Its height is about 3429 feet.

BENZINE, or **BENZENE** (C_6H_6), a colourless, limpid liquid, first obtained by Faraday in 1825 from the liquid condensed in the preparation of gas from various fixed oils. It is now manufactured from coal-tar and other similar substances, and is extensively used in the arts on account of its great power as a solvent of resins and fats. It is very inflammable and has an agreeable smell. Benzine forms the starting-point of a large number of important derivatives, among which are toluene, xylene, aniline, &c.

BENZOIC ACID ($C_6H_5O_2$) exists ready formed in certain balsams (which see), as of Peru and Tolu, in gum benzoïn, and in the urine of man and herbivorous animals, and it is, besides, the product of a number of chemical reactions. It is easily obtained from gum benzoïn, by heating it for some hours in a pot covered with a paper cap. The acid sublimes, and the cap on removal is found encrusted with light brilliant white prisms, which are almost pure, except a trace of volatile oil, which gives the acid its ordinary odour. The acid can also be extracted in the wet way. When pure it forms crystals, sparingly soluble in cold water, more soluble in hot, and very volatile in aqueous vapour. It sublimes readily; when heated in the air it burns with a bright smoky flame. It forms the salts called benzoates, of which the most important are the alkaline benzoates, and the benzoate of iron, which is employed for separating iron from manganese in solution. See **BENZOÏN**.

BENZON is a solid, fragile, vegetable substance, of a reddish-brown colour. In commerce several varieties are distinguished, of which the yellow, the Siam, and the amygdaloid—the latter containing whitish tears of an almond shape diffused through its substance—and Sumatra firns are the finest. It is imported from Siam, Singapore, Bombay, and occasionally also from Calcutta, and is found also in South America. Benzoin is obtained from the tree called *Styrax benzoïn*, and perhaps from some others. On making incisions into the bark, it flows out in the form of a balsamic juice, having a pungent taste and an agreeable odour. The pure balsam consists of two principal substances, viz. a resin and a peculiar acid termed *benzoic* (which see), which is procured from the mass by sublimation. Benzoin is not soluble in water, but is readily dissolved in alcohol, by the aid of a gentle heat. The tincture thus made is used in pharmacy. A small quantity of this tincture dropped into water, forms a white, milky fluid, which is used in France as a cosmetic, under the name of *lait virginal*. The gum is a principal ingredient of the common court-plaster. The acid, as well as the gum, is employed in medicine: they are stimulating, and act more particularly on the pulmonary system; hence they are used in asthma and chronic catarrh. It is largely used in the ceremonies of the Greek and Roman Catholic churches.

BENZOL. See NAPHTHA.

BEOWULF. See ANGLO-SAXONS—Literature.

BÉRANGER, PIERRE JEAN DE, the songster and national poet of France, was born in Paris on 19th August, 1780, in the house of his grandfather, a tailor in the Rue Montorgueil. His father was a restless and scheming man, and young Béranger, left in a great measure to himself, ran a great chance of spending his life as a *gamin* and vagabond in the streets of Paris. A few days after the destruction of the Bastille he was conveyed to Peronne and placed under the charge of an aunt who kept a tavern, and to whom for a time he acted as waiter. At the age of fourteen he was apprenticed to a M. Laisnez, a printer in Peronne, but after remaining in that employment for some time, was suddenly summoned to Paris by his father, who wished his coadjutorship in the monetary traffic by which he gained his subsistence. A miserable scrambling existence was now that of the young man, who loathed both the business in which he found himself engaged, and the chicanery and intrigue with which it was conducted. The improvidence and prodigality of his father was constantly involving them in difficulties, and Béranger, with as yet no settled vocation in life, was enduring all the hardships and privation which men of genius in a similar position to himself have frequently had to encounter before the recognition of their talents by the world. At one time he thought of accompanying the French army to Egypt, but was dissuaded from doing so by a friend, and continued to occupy his garret in Paris, where, as he informs us, he often lived without a fire, and had his bed wet with rain and snow through holes in the roof. He had now, besides making an unsuccessful attempt in the drama, produced a number of poems, including his *Roger Bontemps*, *Le Grenier*, *Les Gueux*, and *Le Vieil Habit*. Some of these were sent by him in 1804 to Lucien Bonaparte, in the hope thereby of obtaining some patronage or assistance. In this, probably the only application he ever made for aid in the course of a long life, Béranger was not disappointed. Lucien sent for him, encouraged him to proceed in his poetical career, and as a means of support made over to him his own income to which he was entitled as member of the French Institute.

He was afterwards employed in editing the *Annales du Musée*, and in 1809 received an appointment as clerk in the office of the secretary to the university. Many of his songs had now become extremely popular, and in 1815 the first collection of them was published. A second collection was published in 1821, but Béranger had made himself extremely obnoxious to the Bourbon government by his satires on the established order of things; and in addition to being dismissed from his office in the university, he was prosecuted and sentenced to three months' imprisonment and a fine of 500 francs. A third collection appeared in 1825, and a fourth in 1828, which last publication subjected him to a second state prosecution, an imprisonment of nine months, and a fine of 10,000 francs. Nothing, however, could daunt the poet's indomitable spirit, and in prison he still continued to busy himself in the composition of his songs and lyrical satires upon government. In 1833 he published his fifth and last collection, which contains some of the most powerful effusions of his genius. Shortly after the revolution of February, 1848, he was elected representative of the department of the Seine in the constituent assembly, but sent in his resignation in the month of May of same year. The concluding years of his life were spent in a dignified retirement and the enjoyment of the society of a few literary and cherished friends. He died at Paris on July 16, 1857, and received the honour of a public funeral, at which the most eminent men in France, both of the world of literature and politics, attended.

The great attraction of Béranger's songs is the unequalled grace and sprightliness which they display, combined with great descriptive powers, much comic humour, and occasional bursts of indignation and invective when some social or political grievance is denounced. They are sometimes also, it must be admitted, marked by a tendency to levity and looseness of morals, but in this respect they partake eminently of the French character. No one, indeed, was more thoroughly French than Béranger, and the glory of his beloved *patrie*, as paramount to all other considerations, appears constantly as the inspiring genius of his poetry. The intense nationality of his songs constitutes one of their principal charms, and in this respect he bears some resemblance to Thomas Moore. He has sometimes been called the Burns of France, but though like him essentially a poet of the people, he falls far beneath the pathos and depth of feeling displayed by the Ayrshire Bard in depicting the passion of love. In private life Béranger was the most amiable and benevolent of men, beloved by his friends alike for his social qualities and kindness of heart, while his charities were so numerous and extensive as often to exceed the bounds of prudence.

BERAR, also called the **HYDERABAD ASSIGNMENT DISTRICTS**, a province or commissionariat of India, in the Deccan, lies to the south and west of the Central Provinces and to the north of Hyderabad (Haidarabad), touching Bombay territory on the west; area, 17,711 square miles. It consists chiefly of a fertile plain bordered on the north and south by low ranges of hills. It is intersected by the Purna, which flows west to the Taptée, and is partly bounded on the north and south by the Wardha and Penganga flowing east to the Godavari. It has a fertile soil, which produces much good cotton and millet, the best wheat in India, as well as oil-seeds and other produce. The rainfall is regular, and this province is in the position of being able to export food to other parts of India. It is intersected by the railway from Bombay to Nagpur, and ultimately to Howrah, opposite Calcutta. After being ruled by independent sovereigns, it was added in the seventeenth century to the Mogul Empire, and latterly

became part of the Nizam's Dominions (Hyderabad), to which it still in a sense belongs. In 1853 it was assigned or handed over to the British authorities to provide for the payment of the body of troops which the Nizam had been previously bound to furnish in time of war for the Indian government. A new treaty was concluded in 1860 by which certain territorial alterations were brought about, and a considerable debt due by the Nizam was cancelled. The province has greatly prospered under British rule. It consists of six districts, namely Ellichpur, Amraoti, Akola, Buldana, Basim, and Wun. The largest towns are Ellichpur and Amraoti (Oomrawuttee). Berar is under the administration of a revenue and fiscal commissioner superintended by the resident at Hyderabad. There is also a judicial commissioner, who superintends the working of the courts of justice. The surplus revenue, after the expenses of administration and the cost of the Hyderabad contingent of troops are defrayed, is handed over to the government of the Nizam. The pop. of the province in 1891 was 2,897,491.

BERAT, a town of Turkey in Europe, in the vilayet of Janina, on the river Osum, at the foot of Mount Tomor (about 8000 feet high), surrounded by vineyards and olive-plantations. It is the seat of a Greek archbishop, and has a Turkish castle on a high rock. Pop. about 12,000.

BERAUN, a town of Bohemia, 18 miles to the south-west of Prague, on the river Beraun, with manufactures of cotton, sugar, &c. Pop. (1890), 7265.

BERBER. See SUPPLEMENT.

BERBERA, the chief port and town of British Somaliland, on the African coast of the Gulf of Aden and due south of Aden. It has a small but well-sheltered harbour and a long pier. There is a European quarter with stone houses and warehouses, and a native quarter laid out with broad streets but consisting chiefly of huts or sheds. There is a considerable export trade in the products of the country, such as hides and skins, gum, ostrich feathers, ghee, sheep, goats, and cattle; rice, millet, dates, cottons, tobacco, &c., being imported. The traffic is chiefly with Aden. The population is perhaps 6000, increased to 30,000 during the trading season. The Somali Coast Protectorate extends along the coast for about 400 miles and inland for about 200, the area being about 80,000 square miles. Besides Berbera it contains also the ports of Zeilah and Bulhar. It was acquired in 1884, and is administered by a political agent and a consul. A number of Indian troops are stationed in the territory. The trade is of some importance and is increasing.

BERBERS, the name of a people spread over nearly the whole of Northern Africa. From their name the appellation *Barbary* is derived. They are considered the most ancient inhabitants of the country. Their different tribes are scattered over the whole space intervening between the shores of the Atlantic and the confines of Egypt; but the different branches of Atlas are their principal abode; while to the south they extend to the Soudan. The chief branches into which they are divided are, the Amazigh, Amazigh, or Masigh, who are estimated to number from two to two-and-a-half millions, and who inhabit Morocco. They are for the most part quite independent of the Sultan of Morocco, and live partly under chieftains and partly in small republican communities. Second, the Shillooh or Shellakah, who number about 1,450,000, and inhabit the s. of Morocco. They practise agriculture and carry on some manufactures. They are more highly civilized than the Amazigh. Third, the Kabyles in Algeria and Tunis, who are said to number about 1,000,000;

and fourth, the Berbers of the Sahara, who inhabit the oases, and consequently live for the most part at wide intervals from each other. Among the Sahara Berbers the most remarkable are the Beni-Mezab and the Tuareg. To these we may also add the Guanches of the Canary Islands, now extinct, but undoubtedly of the same race. The Berbers generally are about the middle height; their complexion is brown, and sometimes almost black, with brown and glossy hair. Individuals of fair complexion and light hair and even with blue eyes are said to be not uncommon among them. They are generally thin, but extremely strong and robust, and their bodies are beautifully formed. The head of the Berber is rounder than that of the Arab, and the features shorter, but of an equally marked character, although the fine aquiline nose, so common among the latter, is not often seen among the Berbers. The language of the Berbers is said to have affinities with the Semitic tongues. Such of them as mingle with the Arabs speak or understand Arabic; but those who dwell in the interior of the mountains understand no other language than their own. The Berbers often leave their mountains to plunder travellers on the plain. They generally dwell in huts, or rude houses, the latter rectangular, with two gable ends, covered with thatch and entered by a low and narrow door. These dwellings are often built in little groups, scattered about in the valleys and upon the sides of the mountains, and in some parts each group of huts is situated in the midst of a plantation, with a portion of ground laid out as a kitchen-garden. Although the Berbers have always lived in a state of ignorance, and have had but little connection with civilized nations, they are remarkably industrious. By working the mines in their own mountains they produce lead, copper, and iron. With the iron they manufacture gun-barrels, implements of husbandry, and many rudely-formed utensils. They understand the manufacture of steel, from which they make knives, swords, and other instruments, not very elegant in form, but of good quality. They likewise make gunpowder for their own use, and this powder is said to be of very superior quality. One of their articles of commerce is a species of black soap, which they make with olive-oil and soda obtained from sea-weed.—The tribes inhabiting the borders of the plains and some of the great valleys breed sheep and cattle in considerable numbers. Their sheep are small and yield very little wool. They have likewise numerous herds of goats, which supply them with milk, and of the flesh of which they are very fond. Their cows and oxen are of a small species, but their asses and mules are much esteemed.

BERBICE, a district of British Guiana, intersected by the river Berbice. It extends from the river Abary on the w. to Corentyn River on the e., about 150 miles along the coast, the boundary inland not being fixed. The chief town is New Amsterdam. The principal productions are sugar, rum, cotton, coffee, cocoa, and tobacco. The coast is marshy and the air damp. Berbice came finally into British possession in 1815, having previously belonged to the Dutch. Till 1831 it formed a separate colony from Demerara and Essequibo. (See GUIANA.) Pop. (1891), 51,176.—The river Berbice is a stream of considerable size, but its course is obstructed by cataracts and there is a bar at its mouth. Small craft ascend it, however, for 150 miles.

BERCHEM. See BRECHEN.

BERCHTESGADEN, a village of Bavaria, situated in a most picturesque and much-visited region, about 12 miles south of Salzburg, on the Achen, or Alm, a stream which issues from the beautiful lake

called the *Königssee*. It lies on a mountain slope surrounded by meadows and trees, consists of well-built houses, and has a fine old abbey, now a royal residence; the abbey church, with fine Romanesque transepts of the twelfth century; a royal villa; &c. Wood-carving is extensively carried on, and there is an important salt-mine. Pop. (1895), 2349.

BERCY, formerly a village on the Seine (here crossed by a suspension bridge), now forming part of Paris. The Parisian wine merchants have here their stores of wine, spirits, &c., and there are several important tanneries, sugar-refineries, and paper-mills. A large palace, *Le Grand Bercy*, was built by Leveau at the close of the seventeenth century.

BERDIANSK, a seaport of Southern Russia, in the government of Taurida, on the northern shore of the Sea of Azof. It contains many handsome houses, arranged in spacious streets, and has a good anchorage, sheltered on all sides except the s. It is the chief entrepôt for the surrounding governments, and exports large quantities of grain, oil-seeds, and wool. It has also a large inland trade in wood, coal, fish, and salt, the last obtained from mines in the vicinity, which are apparently inexhaustible. Pop. (1894), 24,620.

BERDITCHEF (Pol. *Berdyczewo*), a city of European Russia, in the government and 129 miles w.s.w. Kiev, and 25 miles s. Jitomir. It is an ill-built place, swarming with Jews, but contains several churches and synagogues, and a large Carmelite convent, in the church of which is an image of the Virgin Mary, the object of pilgrimages. It carries on a considerable trade in corn, wine, cattle, honey, wax, and leather; and it is famous for its quarterly fairs. At these goods to the value of about £800,000 are disposed of, and much business is done, especially with Austrian dealers. Berditchef came into the possession of Russia in 1793. Pop. in 1897, 53,728.

BEREANS, in modern church history an insignificant sect of dissenters from the Church of Scotland, who take their title from, and profess to follow the example of, the ancient Bereans (see Acts xvii. 10-13) in building their system of faith and practice upon the Scriptures alone, without regard to any human authority whatever. They agree with the great majority of Christians, both Protestants and Catholics, respecting the doctrine of the Trinity, which they hold as a fundamental article of the Christian faith; but they differ from the majority of all sects of Christians in various other important particulars. For instance, they say that the majority of professed Christians stumble at the very threshold of revelation by admitting the doctrine of natural religion, natural conscience, &c. not founded upon revelation or derived from it by tradition. With regard to faith in Christ, they insist, that as faith is the gift of God alone, so the person to whom it is given is as conscious of possessing it as the being to whom God gives life is of being alive, and therefore he entertains no doubts either of his faith or his consequent salvation through the merits of Christ, who died and rose again for that purpose. Consistently with the above definition of faith, they say that the sin against the Holy Ghost is simply unbelief. Their mode of practice and church government differs but little from those of many other dissenting sects.

BERENGAR, the name of two kings of Italy in the ninth and tenth centuries.—**BERENGAR I.**, son of the Duke of Friuli by a daughter of Louis-le-Debonnaire, during the confusion which followed on the dissolution of the empire of Charlemagne laid claim to the crown of Italy, and after a civil war obtained it in 888. At a later period, having been invited by Pope John X. to repel the Saracens who were devastating the south of Italy, he was rewarded

for his success by receiving from the pope the crown and title of Emperor of Rome. His warlike expeditions had generally been fortunate, and his internal government was generally acceptable to his subjects; but his nobility, jealous of his authority, stirred up a new competitor for the throne in the person of Rudolf II., who invaded Italy in 921, and ultimately obliged Berengar to take refuge in Verona, where a wretch, whose life he had once spared, assassinated him in 924.—**BERENGAR II.**, nephew of the former by a daughter, was at first Marquis of Ivrea, and the throne of Italy was occupied by Hugo, count of Provence, who, by acting the part of a tyrant, had incurred the enmity of almost all the great feudal lords of the kingdom. Berengar, taking advantage of this feeling, put himself at the head of a force collected in Germany in 945, and was almost universally welcomed. Hugo, seeing his case desperate, abdicated in favour of his son Lothario, who reigned nominally for a few years, and was succeeded in 950 by Berengar, in whom all the powers of the government had previously centred. A quarrel with the Emperor Otto in the following year deprived him of his throne, but he was permitted to resume it on agreeing to acknowledge Otto as his liege lord. In a second quarrel he was not allowed to escape so easily. After losing his territories he shut himself up in the fortress of St. Leo, and defended himself bravely till famine compelled him to submit. He was imprisoned at Bamberg, and died there in 968.

BERENGARIO, JACOPO, a distinguished anatomist of the sixteenth century, born about 1470 at Carpi, in the duchy of Modena, took his degree at Bologna, taught anatomy and surgery at Pavia, and returning again to Bologna, finally settled there till a clamour, caused by a rumour that he had got possession of two Spaniards affected with a loathsome disease, and was intending to dissect them alive, obliged him to retire to Ferrara, where he died in 1530. This rumour, caused doubtless by the fact that Berengario looked upon the dissection of the human body as the only means by which the science of anatomy could be advanced, points out the source of the many important discoveries which he made, and the others for which he paved the way, leaving them to be followed out by Vesalius, Eustachius, and Fallopius. He is justly regarded as one of the principal founders of modern anatomy. He was also a dexterous operator, and published a practical work entitled *De Crani Fractura*.

BERENGARIUS, or **BERENGAR**, of TOURS, a teacher in the philosophical school of that city, and in 1040 archdeacon of Angers, is renowned for his philosophical acuteness as one of the scholastic writers, and also for the boldness with which in 1050 he declared himself against the doctrine of transubstantiation, and for his consequent persecutions. He was several times compelled to recant, but always returned to the same opinion, that the bread in the Lord's supper is merely a symbol of the body of Christ, in which he agreed with the Irish philosopher John Scotus Erigena. The Catholics ranked him among the most dangerous heretics. He was treated with forbearance by Gregory VII., but the scholastics belonging to the party of the great Lanfranc, archbishop of Canterbury, were irritated against him to such a degree that he retired to the Isle of St. Cosmes in the neighbourhood of Tours in the year 1080, where he closed his life at a great age in pious exercises in 1088. On the history of this controversy, which has been very much misrepresented by the Benedictines, new light was shed by Lessing in his *Berengar* (1770), and also by Staundlin, who likewise published the work of Berengarius against Lanfranc. This Berengarius must not be confounded with Peter Berengar of

Pottier, who wrote a defence of his instructor Abelard.

BERENHORST, FRANÇOIS LEOPOLD VON, one of the first of the writers by whom the military art has been founded on clear and certain principles. He was a natural son of Prince Leopold of Dessau, and was born in 1738. In 1760 he became the adjutant of Frederick II. After the seven years' war he lived at Dessau. He died in 1814.

BERENIOE (a bringer of victory).—1. This was the name of the wife of Mithridates the Great, king of Pontus. Her husband, when vanquished by Lucullus, caused her to be put to death (about the year 71 B.C.), lest she should fall into the hands of his enemies. Mithras his other wife, and his two sisters Roxana and Statira, experienced the same fate.—2. The wife of Herod, brother to the great Agrippa, her father, at whose request Herod was made King of Chalcis by the Emperor Claudius, but soon died. In spite of her dissolute life, she insinuated herself into the favour of the Emperor Vespasian and his son Titus. The latter was at one time on the point of marrying her.—3. The wife of Ptolemy Evergetes, who loved her husband with rare tenderness, and when he went to war in Syria made a vow to devote her beautiful hair to the gods if he returned safe. Upon his return Berenice performed her vow in the temple of Venus. Soon after the hair was missed, and the astronomer Conon of Samos declared that the gods had transferred it to the skies as a constellation. From this circumstance the seven stars near the tail of the Lion are called *Coma Berenices* (the hair of Berenice).

BERESFORD, WILLIAM CARR, VISCOUNT, a distinguished commander, was a natural son of the first Marquis of Waterford, and born on 2d October, 1768. He entered the army, and at the age of eighteen, while serving in Nova Scotia, had the misfortune to lose the sight of an eye by an accidental shot. He afterwards served at Toulon, and in Corsica; in the West Indies under Abercromby; and in Egypt under Baird. In 1806 he was raised to the rank of brigadier-general, and the same year commanded the land force in the expedition to Buenos Ayres. Having been ordered to Portugal in 1808, he was intrusted there with the remodelling of the Portuguese army—an office which he accomplished with great success; and in acknowledgment of his services was created a Marshal of Portugal, Duke of Elvas, and Marquis of Santo Campo. He subsequently took part in the siege of Badajoz, and the battles of Salamanca, Vittoria, and Bayonne. For his bravery at the battle of Toulouse he was raised to the peerage, with the title of Baron Beresford, afterwards superseded by that of Viscount Beresford, which was conferred on him in 1823. In political principles he was a high Conservative; and in the House of Lords he was a thorough supporter of the Duke of Wellington. In 1828, when the duke became premier, he was made master-general of the ordnance, a post he held till 1830. In 1832 he married his cousin Louisa, daughter of the Archbishop of Tuam, and widow of Mr. Hope, the banker. He died at Bedgebury Park, Kent, on 8th Jan. 1854.

BEREZINA, a river in the Russian province of Minsk, rendered famous by the passage of the French army under Napoleon, Nov. 26 and 27, 1812. Admiral Tchitchakoff, with the Moldavian army, forced his way from the S. to join the main army, which, after Borisoff had been retaken, was to assist the army led by Wittgenstein from the Dwina, and in this manner cut off Napoleon from the Vistula. Napoleon was therefore obliged to make the greatest efforts, notwithstanding immense difficulties occasioned by the nature of the country, the climate, and

the critical situation of his troops, to reach Minsk, or at least the Berezina, and to pass it earlier than the Russians. To effect this it was necessary to sacrifice a great part of the baggage and artillery. Nov. 25. After the advanced guard of the Moldavian army had been repelled to Borisoff by Oudinot, and the bridge there burned by them, early in the morning of Nov. 26, two bridges were built near Semlin, about 2 miles above Borisoff, an undertaking the more difficult, because both banks of the river were bordered by extensive morasses, covered, like the river itself, with ice not sufficiently strong to afford passage to the army, while other passes were already threatened by the Russians. Scarcely had a few corps effected their passage, when the greater part of the army, unarmed and in confusion, rushed in crowds upon the bridges. Discipline had long before disappeared. The confusion increased with every minute. Those who could not hope to escape over the bridges sought their safety on the floating ice of the Berezina, where most of them perished, while many others were crowded into the river by their comrades. In this fatal retreat the Duke of Reggio (Oudinot) led the advanced guard, with the Poles under Dombrowsky in front; the rear-guard was formed by the corps of the Duke of Belluno. Nov. 27, at noon, the rear-guard was gained, and the army, leaving the road to Minsk, took that of Wilna to Warsaw, with the hope of providing for their necessities in Wilna.—Besides the multitudes who were obliged to remain beyond the Berezina, the division of Partouneaux, which formed the rear-guard, was also lost. It was intrusted with the charge of burning the bridges in its rear, but it fell into the hands of the enemy. According to the French bulletins only a detachment of 2000 men, who missed their way, was taken; according to the Russian accounts the whole corps, 7500 men and five generals.

BEREZOV, or BEREZOFF (the town of birch-trees), a town in Siberia, in the government of, and 400 miles N. from Tobolsk, on a height above the left bank of the Soeva, one of the branches of the Obi. It consists of wooden houses carefully built of large timbers, and generally with high steps in front, and contains three churches and a chapel. Its inhabitants, who are chiefly Cossacks, subsist by the chase and by fishing; they barter furs, skins, fish, &c., for flour, flesh-meat, tobacco, ironware, and brandy, brought by the Tobolsk dealers, whose craft are floated down the Irtysh into the Obi. Prince Menzikoff, the favourite of Peter the Great, died here in exile in 1751, having been banished by his grandson Peter II. Pop. (1892), 2117.

BERG, an ancient duchy of Germany, forming part of Rhenish Prussia, and now included in governments Arnsherg, Cologne, and Düsseldorf. It extended along the Rhine from the Ruhr to the frontier of Nassau, and is everywhere hilly. It is more a manufacturing than an agricultural district, and has long been famed for its minerals, which include iron of the finest quality, lead, copper, zinc, and the precious metals. In addition to the employment furnished by these minerals, the inhabitants, who are very industrious, have with considerable success superadded textile manufactures. It is now indeed the chief manufacturing district in Germany, and the most densely peopled. It contains the busy towns of Elberfeld, Barmen, &c. The duchy of Berg, founded in 1389, had been long consolidated with the Prussian dominions when (1806) Napoleon revived the title, and conferred it, with an enlarged territory, on Murat. On Murat's receiving the kingdom of Naples, Napoleon named his nephew Louis Napoleon (brother of the late Emperor Napoleon III.) hereditary

ditary Grand-duke of Berg, and increased its limits still farther. At the Congress of Vienna, in 1815, the whole was given to the King of Prussia.

BERGA, a town of Spain, in the province of Barcelona, in a hilly district near the river Lobregat. There is an old castle overlooking the town, which carries on some manufactures of cottons. Pop. (1897), 5239.

BERGAMA, a town of Asia Minor, about 20 miles inland from the west coast, on the Selinus, a tributary of the Caicus, 46 miles N. by E. Smyrna. It occupies the site of the ancient Pergamus (which see), and contains numerous remains attesting its ancient magnificence. In the centre are the remains of a large Roman basilica, a Byzantine church now converted into a mosque, and a curious double tunnel 200 yards long through which the river runs. To the east of the town is a steep hill with the acropolis and the remains of a Roman palace on the top. To the west of the town are the ruins of the ancient amphitheatre with arches of fine workmanship. It was built so that the arena could be flooded with water from a stream, thus affording an opportunity for nautical sports. Bergama is a flourishing town noted for its manufactures of morocco leather. Pop. about 16,000.

BERGAMO, capital of the province of Bergamo (1028 Eng. square miles, and 390,775 inhabitants), in the Kingdom of Italy, division Lombardy, is situated in the district lying between the rivers Brembo and Serio and is a thriving trading and manufacturing town. It consists of two distinct portions, the Città Alta (High Town), situated on hills, and now attainable by a cable tramway, and the much more extensive new quarters in the plain. Bergamo trades largely in silk, silk goods, grain, &c. At its fair goods to the value of a million sterling have sometimes been sold. It has an academy of painting and sculpture, a museum, an atheneum, a public library, several secondary schools, and various manufactures, especially of silk. There is a cathedral, but some of the other churches are of greater interest. There is a small Protestant congregation. The comic characters in the Italian masked comedy are Bergamese, or affect the dialect of the country people in the neighbourhood of this city. In 1796 Bonaparte took Bergamo, and it was subsequently made the capital of the department of the Serio, in the Kingdom of Italy. Amongst many distinguished men born here are Tiraboschi, the historian of Italian literature, the composer Donizetti, and Cardinal Mai. Pop. in 1894 estimated at 45,000, including suburbs.

BERGAMOT, a kind of fruit generally regarded as a variety of the orange, though some consider it a distinct species. The bergamot is cultivated in the S. of Europe, into which it is believed to have been introduced from the East. The fruit is pear-shaped and pale yellow in colour, with a fragrant and slightly acid pulp. Its essential oil is in high esteem as a perfume.—*Bergamot* is also a name given to a number of different pears.

BERGEDORF, a town of Germany, a short distance to the south-east of Hamburg, and in the territory belonging to that city, on the Bille, a tributary of the Elbe. Pop. (1900), 10,243.

BERGEN, a seaport on the W. coast of Norway, capital of a province or diocese of the same name, formerly the principal town of the kingdom, but now the second. It is 186 miles N.W. of Christiania, and about 25 from the open sea, and is situated on and about the head of two creeks or inlets one of which forms the harbour. The tongue of land between the harbour and the other inlet (Puddefjord) rises to form an elevated ridge crowned by an old fort, while

the entrance of the harbour on the other or north-east side is commanded by the old fortress of Bergenhus, now partly used as a prison, and also containing apartments for the use of the royal family. Rocky hills from 800 to 2000 feet high encircle the town on the land side and furnish many picturesque spots. The climate is comparatively mild, on account of the sheltered situation, but is remarkable for rain, the annual rainfall being about 78 inches. The town is well built and clean, but the houses are mostly of wood, and many of the streets are crooked and uneven, on account of the irregularity of the site. There are a number of squares or open spaces, including the market-place at the head of the harbour. There are a cathedral (built in 1537), and several other churches, the oldest being St. Mary's, built after a fire in 1249. The public institutions include a classical school, a real-school, a school of navigation, a library of 60,000 vols., a theatre, a museum, and other useful institutions. The museum contains a fine collection of northern antiquities, a cabinet of coins, a natural history collection, and a picture gallery. The inhabitants of the middle coast of Norway bring timber, tar, train-oil, hides, &c., and particularly dried fish (stock-fish), to Bergen to exchange them for grain, flour, and other necessities. The town carries on a large trade in these commodities, and its exports of dried fish, herrings, tar, &c., are especially large. A considerable amount of ship-building is carried on. Bergen was founded by King Olaf Kyrre in 1070. The Hanseatic league established a factory here about 1340 and long monopolized the trade. Bergen is the native place of the poet Holberg. Pop. (1885), 46,552; (1891) 53,686; (1900) 72,179.

BERGEN-OP-ZOOM, a town of Holland, in a marshy situation on the Scheldt, where the Zoon enters it, 20 miles N.W. of Antwerp. It was formerly a strong fortress, the morasses around it making it almost inaccessible to an assailing force while its fortifications consisted of regular works constructed by the celebrated Coehorn. It is well built, but has no edifices deserving of particular notice. It made an important figure during the Spanish war, and successfully resisted the attacks of the Duke of Parma in 1681 and 1688, and of Spinola in 1622. It was taken by the French in 1747 after a siege of nearly three months; and in 1795 the French under Pichegru again gained possession of it by capitulation. It was unsuccessfully attempted by the British under Sir Thomas Graham, afterwards Lord Lynedoch, in 1814. Its trade has suffered greatly from the proximity of Antwerp. Pop. (1899) 13,668.

BERGERAC, a town of France, in the department of the Dordogne, and on the river Dordogne. There are here paper-mills, ironworks, distilleries &c. The town, 48 miles N. of Bordeaux, gives the name to an agreeable wine cultivated on the bank of the Dordogne, in France sometimes called *petit champagne*. Pop. (1896), 10,697.

BERGHEM, **NICHOLOAS**, an eminent painter, was born at Harlem in 1624, and received his first instruction in painting from his father, Peter of Harlem, who was a very indifferent artist. He then continued his studies under Van Goyen and the elder Weenix. Love of his art and the great demand for his paintings, as likewise the avarice of his wife prompted him to labour with extreme assiduity. To buy engravings, of which he was very fond, he was often compelled to borrow money from his students which he could only refund by deceiving his wife in regard to the price of his paintings. In this manner he obtained a rich collection. Berghem's landscapes and representations of animals adorn the most cele

brated galleries. The distinguishing characters of the pictures of Berghem are the breadth and just distribution of the lights, the grandeur of his masses of light and shadow, the natural ease and simplicity in the attitudes of his figures, the brilliancy and harmony as well as transparency of his colouring, the correctness and true perspective of his design, and the elegance of his composition. Although he hardly ever left his workshop, yet he had closely observed nature during a long residence in the palace of Benthem. He died at Harlem, 1683. Charles Dujardin and Glauber were among his pupils.

BERGMAN, TOBBERN OLOF, a natural philosopher and chemist, was born at Catharineberg, in the Swedish province of West Gothland, March 20, 1735, and obtained after many difficulties the permission of his family to devote himself entirely to the sciences. At that time disciples flocked from all quarters to Linneus at Upsal. They were joined by Bergman in 1752, who by his acuteness and his discoveries in natural history, especially in entomology and botany, excited the notice of this great man. In 1758 he became Doctor of Philosophy and professor of physics at Upsal. Upon the resignation of the celebrated Wallerius, Bergman was a candidate for the professorship of chemistry and mineralogy. His competitors charged him with ignorance of the subject, because he had never written on it. To refute them he shut himself up for some time in a laboratory, and prepared a treatise on the manufacture of alum, which is still considered as a standard work. In 1787 he became professor of chemistry, and devoted himself with ardour to this science. He invented the preparation of artificial mineral waters, and discovered the sulphuretted hydrogen gas of mineral springs. We are indebted to him for a knowledge of the characters which distinguish nickel from other metals. On a number of minerals he made chemical experiments, with an accuracy before uncommon. He published a classification of minerals, in which the chief divisions are based on their chemical character, and the subdivisions on their external form. In preparing this work he was much aided by his former discovery of the geometrical relations between different crystals of the same substance, which may be deduced from one primitive form, and are produced by the aggregation of similar particles, according to fixed and obvious laws. His theory of the chemical relations is still esteemed, and if it has received some new developments from the further researches of Berthollet, it has not been overthrown. The order of Gustavus Vasa was bestowed on Bergman. He declined the invitation of Frederick the Great to remove to Berlin. He died exhausted by his exertions in 1784, in the forty-ninth year of his age. Among his works the first place is due to *Opuscula Physica, Chemica, et Mineralia* (Stockholm, 1779-84, six vols.), of which an English translation appeared.

BERGUES, a town, France, in the department of Nord, in a marshy district, at the junction of the Bergues, Dunkirk, and Colme canals, 5 miles s. of Dunkirk; population (1891), 5380. It ranks as a fortress of the second class, is well built of brick, and having a basin which admits vessels of 250 tons, is the centre of a considerable trade. Its principal edifices are the townhouse, and a beautiful and richly ornamented belfry above 160 feet high. It owes its origin to the castle of Berg, to which St. Winnoc retired in 902, was first fortified by Baldwin II., count of Flanders, afterwards adorned with a magnificent monastery of St. Winnoc by Baldwin IV., and in the thirteenth century possessed flourishing manufactures. It makes an important figure, and often suffered dreadfully during the wars in the Low Countries.

BERKELEY, a market town, England, 16 miles s.w. of Gloucester, pleasantly situated on the right bank of the Avon, in the rich vale of Berkeley, and celebrated for its castle, where Edward II. was confined and barbarously murdered. Pop. 900.

BERKELEY, DR. GEORGE, Bishop of Cloyne in Ireland, celebrated for his ideal theory. He maintains that the belief in the existence of an exterior material world is false and inconsistent with itself; that those things which are called *sensible material objects* are not external but exist in the mind, and are merely impressions made on our minds by the immediate act of God, according to certain rules termed *laws of nature*, from which he never deviates; and that the steady adherence of the Supreme Spirit to these rules is what constitutes the reality of things to his creatures; and so effectually distinguishes the ideas perceived by sense from such as are the work of the mind itself or of dreams, that there is no more danger of confounding them together on this hypothesis than on that of the existence of matter. He was born at Kilcrist, Ireland, in 1684; became fellow of Trinity College, Dublin, in 1707; travelled in Italy as far as Leghorn in 1713 and 1714, and at a later period accompanied Mr. Ashe, son of the Bishop of Clogher, on a tour through Italy, Sicily, and France. In 1721 he was appointed chaplain to the Lord-lieutenant of Ireland, the Duke of Grafton. He appeared with much applause as an author before he was twenty years old. His works on philosophy and mathematics (among which his *Theory of Vision*, published in 1709, is the most brilliant proof of the author's acuteness) procured him a widespread fame. By a legacy of Miss Vanhomrigh, the celebrated Vanessa, who has become so generally known through her love to Swift, his fortune was considerably increased. In 1724 he was promoted to the deanery of Derry and resigned his fellowship. He now published his *Proposals for the Conversion of the American Savages to Christianity by the Establishment of a College in the Bermuda Islands*. The project was very favourably received, and persons of the first rank raised considerable sums by subscription to aid it; and Berkeley having resigned his preferment set sail for Rhode Island, with several other persons of similar views, to make arrangements for carrying on his college. The assistance of Parliament, which had been promised, not being afforded, his undertaking miscarried, after he had spent seven years and a considerable part of his fortune in his efforts to accomplish it. He afterward wrote numerous philosophical, religious, and politico-economical works. Towards his sixtieth year he was attacked by a nervous colic, which he attempted to cure by the use of tar-water, whereby he was induced to publish two treatises on the utility of this water. He died suddenly at Oxford in 1753. Berkeley is said to have been acquainted with almost all branches of human knowledge. His character commanded the respect and love of all who knew him. Pope, his constant friend, describes him as possessed of 'every virtue under heaven.' His most celebrated philosophical works are—*A Treatise on the Principles of Human Knowledge* (London, 1710); *Three Dialogues between Hylas and Philonous* (London, 1713); *Alciphron, or the Minute Philosopher* (London, 1732). His works appeared in London, 1784, two vols. 4to preceded by a biography written by Arbuthnot. A new edition of his works, in three vols. 8vo, by Professor Fraser of Edinburgh, was published in 1871, together with his *Life and Letters* in one vol.

BERKENHOUT, JOHN, a Dutch-English physician and general writer, born at Leeds about 1780. Having entered the Prussian service, he rose to the rank of captain. In 1766 he quitted that service and

entered into that of England, where he obtained the same rank. At the peace in 1760 he went to Edinburgh and began the study of physic; while there he published his *Clavis Anglica Lingua Botanica*, a book of great merit; in 1765 he went to Leyden, and took his degree of M.D. On his return to England he settled at Isleworth, in Middlesex, and soon after published his *Pharmacopoeia Medicæ*, which passed through three editions. In 1778 he attended the British commissioners to America, and at Philadelphia he was committed to prison, but he soon afterwards was set at liberty, and returned with the commissioners to England, where he obtained a pension. He died in 1791, aged sixty. Dr. Berkenhout was an industrious writer, and his publications possess considerable merit.

BERKHAMPSTEAD, or **BERKHAMSTED**, GREAT, a town in England, Hertfordshire, beautifully situated in a hollow, surrounded by hills, on the Bulbourn, and on the London and N. W. Railway. It consists almost wholly of one main street, and has a fine old church, restored 1871-87; several chapels; Berkhamsted School, with a fine chapel (1895); a high school for girls; many other schools; &c. There are works for wooden ware, a large chemical work, a boat-building yard, brush, coach, and mantle factories, an iron-foundry, &c. The poet Cowper was born here in 1731. Pop. (1901), 5219.

BERKHEY, **JOHANNES LEFRANCO VAN**, one of the most eminent Dutch writers of the eighteenth century, was born at Leyden in 1729, and died there in 1812. His work entitled *Naturlijke Historie van Holland* first brought him into notice, and procured him the appointment of lecturer on natural history to the Leyden Academy. He also distinguished himself as a poet, though he often manifests a tendency to bombast, and indulges in false pathos. One of his best poems, entitled *Het Verheerlijkt Leyden*, was composed to celebrate the second centenary of his native town, and was publicly read by himself at the great festival held on the occasion in the hospital church in 1774. A great explosion of gunpowder in 1807 destroyed his house and means.

BERKSHIRE, a county of England, bounded on the n. by Oxfordshire and Buckinghamshire, from which it is separated by the Thames; on the e. by Surrey; on the s. by Hampshire; and on the w. by Wilts. It also touches the county of Gloucester on the N.W. The area is 450,132 acres or 703 sq. miles. Its shape is very irregular, and has been compared to that of a shoe or slipper. The western and central parts are deemed the most fertile, the east being principally occupied by Windsor Forest and its appendages, together with a considerable portion of uninclosed and uncultivated land. A range of chalk hills, entering from Oxfordshire, crosses the county in a westerly direction, and forms a boundary to the fertile vale of Whitehorse, so called from the gigantic form of a horse which has been scooped out on the side of a chalk hill, so as to become conspicuous to all the country round. The cultivated parts of the county, and more especially this vale, are peculiarly fruitful in barley. They also contain much rich pasturage and many excellent dairy farms. Timber abounds, particularly oak and beech, in Windsor Forest and towards the west. Owing to the extent of the forest above mentioned, as also of Maidenhead Thicket, Tylehurst Heath, and the numerous commons in all directions, a very considerable part of the county is unproductive of anything but wood, wild fowl, and game. No minerals of consequence have yet been found. The rivers of Berkshire are the Thames, the Kennet, the Lambourn, the Ock, and the Loddon. The Thames enters the county about a mile south of Lechlade, and waters in its course the

towns of Abingdon, Wallingford, Reading, Henley, Maidenhead, and Windsor, to the great advantage of the trade of the whole of them, by forming so fine a water communication with the great mart of the metropolis. The Kennet enters near Hungerford and passing Newbury, flows into the Thames at Reading. The Lambourn rises near that town, and falls into the Kennet below Newbury. The Ock rises in the vale of Whitehorse, and falls into the Thames near Abingdon, as does the Loddon near Wargrave. Nearly a fourth of the area is under cereal crops (wheat, oats, and barley), and considerably more than a fourth under permanent pasture. Turnips are an important crop. There are but few manufactures carried on in this county, the principal being agricultural implements and artificial manures, flour, paper, sacking and sail-cloth, and biscuits (at Reading). Malt is made in great quantities, and chiefly sent to London. A few of the peasantry in some parts derive employment from digging peat for fuel. The principal towns of Berkshire are Reading (the county town), Newbury, Maidenhead, Wokingham, Wallingford, Windsor, Abingdon, Wantage, and Faringdon. Berkshire returns three members to the House of Commons: one for the Northern or Abingdon division; one for the Southern or Newbury division; and one for the Eastern or Wokingham division. Pop. (1881), 218,363; (1891), 238,709; (1901), 254,931.

BERLICHINGEN, **GÖTZ** or **GODFREY VON**, with the Iron Hand; born at Jaxthausen, in Swabia; a bold, restless, warlike, and honourable German knight of the sixteenth century. He placed himself at the head of a body of the rebellious peasants, in the war which they waged against their oppressors (see PEASANTS' WAR), but was soon made prisoner. Before that time he had lost his right hand, and therefore wore one made of iron. He died July 23, 1562. His biography, written by himself, was printed at Nuremberg in 1731 and 1775, and, for the third time, at Breslau in 1813. This book contains an excellent picture of the social life and customs of the time, and has furnished Goethe with the subject for his drama, *Goetz von Berlichingen*, translated by Sir Walter Scott.

BERLIN (anciently *Berle*—uncultivated land), the capital of the Prussian dominions and of the German Empire, the residence of the Emperor of Germany and foreign ambassadors, province of Brandenburg; lat. (new observatory) 52° 30' 16" N.; lon. 13° 23' 53" E.; the largest town in Germany, and, for the beauty and size of its buildings, the regularity of its streets, the importance of its institutions of science and art, and its activity, industry, and trade, one of the first cities in Europe. It is situated on a dreary sandy plain, about 126 feet above the level of the sea, on both sides of the Spree, a sluggish stream here about 200 feet broad, which winds through the city from S.E. to N.W., and divides into several branches and canals. The main stream and its branches are spanned by a large number of bridges. The city has water communication to the North Sea by the Spree, which flows into the Havel, one of the principal tributaries of the Elbe, and to the Baltic by canals connecting with the Oder. The oldest portion of the city lies on an island in the Spree and on the right bank of the river, and is in part irregularly built, with narrow crooked streets and indifferent houses. A newer portion, on the other or left bank, rose up, as if by magic, at the orders of Frederick the Great; the site, according to his plan, being covered with straight and spacious streets, running at right angles to each other, and being lined by handsome houses of uniform appearance. These portions, however, form a comparatively small part of the present city, which has extended itself on every side

its growth since about 1860 having been very rapid. The houses are mostly of white freestone, or of brick covered with a coating of plaster or cement. The drainage of the city, owing to the flatness of the ground on which it stands and to the sluggishness of the Spree, is defective, though much improvement has been made on it in recent years. The streets are well paved and lighted. The houses generally are heated with stoves. Of the numerous bridges, the finest is the Castle Bridge, connecting the great street Unter den Linden with the Spree island, about 104 feet wide, and having its eight piers surmounted by colossal groups of sculpture in marble. Another fine bridge is that of Kaiser Wilhelm, from the island to the other side of the Spree. The principal and most-frequented street, the Unter den Linden ('under the lime-trees'), is in some respects unsurpassed. It is situated on the left side of the river and runs in a direction nearly from E. to W. It is about two-thirds of a mile in length, and of remarkable width (160 feet), the centre being occupied by a double avenue of lime-trees, which give it its name and form a fine shady promenade; while on either side of the trees is a carriage-way, and beyond each carriage-way, in front of the houses, a spacious foot-pavement. At or near the E. end of this street, and also round the Lustgarten, a square with which it is connected by the Castle Bridge, are clustered a number of the principal public buildings of the city; such as the royal and imperial palace (Schloss), the palace of the Emperor William I., the palace of the Emperor Frederick III., the arsenal, the university, the museums, the cathedral, royal academy, opera-house, &c.; while at the W. end it terminates magnificently with the Brandenburg Gate, a noble structure, modelled on a grand scale after the Propylæum of Athens, and regarded as one of the finest portals in existence. The gateway is surmounted by a colossal Victory in bronze, mounted in a car drawn by four horses. Immediately beyond this portal is the Thiergarten ('zoological garden'), an extensive and well-wooded park, interspersed with ponds, shrubberies, and trees, and containing the palace of Bellevue, as well as elegant villas and places of public amusement. There are also several other public parks. Running partly along the east side of the Thiergarten and taking a bend to the south-east is the new street or boulevard called the Königsgratzerstrasse, longer than the Unter den Linden but not so wide; and running transversely to the Unter den Linden are several good streets, including the Wilhelmstrasse, a long straight street on either side of which are various public buildings, palaces, &c. In or in the close vicinity of the Unter den Linden are to be found clustered together perhaps a larger number of fine buildings than any city can show in the same area.

Among the principal public buildings deserving more particular notice the first is the royal and imperial palace or Schloss, a vast rectangular pile, extended and altered at various times, more remarkable for a certain air of grandeur than architectural beauty. To it belongs a large and richly decorated chapel, whose lofty dome forms the most striking external feature of the building. On the opposite side of the square or garden (Lustgarten) from the Schloss is the museum, a fine building in pure Grecian taste, with an extensive collection of sculpture and painting; and behind it the new museum, containing extensive collections of Egyptian and other antiquities, and also the celebrated mural paintings by Kaulbach. Of the numerous churches (the great majority of which are Protestant) only four belong to the middle ages. Many of those recently erected are fine structures, the most important

being the cathedral (not yet completed), an elaborate domed structure in the Italian Renaissance style situated on the east side of the Lustgarten; estimated cost, £500,000. The royal theatre is a fine Grecian edifice, one of the most important works of the eminent architect Schinkel. The arsenal (Zeughaus) is an excellent building in the Renaissance style (1695-1708), containing a vast collection of objects illustrating the history and operations of warfare, many of them of great antiquity. The university, the exchange, the opera-house, the principal Jewish synagogue, the town-hall (cost £500,000), and the architectural academy, are all beautiful structures. There are various public monuments, such as the one in memory of the soldiers who fell in the wars of 1864, 1866, and 1870-71, and several others; but the most remarkable is that erected in 1851 to Frederick the Great in the Unter den Linden—the *chef d'œuvre* of Rauch and his pupils. The colossal statue of the king on horseback is placed on a lofty pedestal, around which are grouped bronze figures representing his principal generals, ministers, and eminent men of his time—in all thirty-one portrait statues the size of life, those at the four corners being on horseback. In front of the arsenal are statues in bronze of Blücher, and of Generals York and Gneisen—the former by Rauch and the two latter by Freidel. There are marble statues by Rauch of Bulow and Sohannhorst, an equestrian statue in bronze of the great elector, Frederick William, and another (colossal) of the Emperor William I. There are also monuments to Luther, Schiller, Goethe, Chamisso, Lessing, Alexander and William von Humboldt, &c.

The literary institutions of the city are numerous and excellent. They include the university, having a staff of some 360 professors and teachers, attended by over 4000 students, exclusive of 1200 to 1400 who do not matriculate, and numbering among its professors many names of European reputation; the academy of sciences; the technical high-school, the mining academy, the high-school of agriculture, the academy of arts, the school of music, the seminary for Oriental languages, the military academy and school of engineering, many gymnasia and real-schools; an institution for instructing the deaf and dumb, &c. The chief libraries are the royal library, founded in 1659, and now containing 900,000 volumes and 25,000 manuscripts; and the university library, with about 300,000 volumes. The public museums and picture-galleries are on a scale adequate to the importance of the city.

Berlin is the literary and scientific metropolis of Germany, and in the various walks of literature, philosophy, science, and art, can show a galaxy of names such as few cities can equal. Since the time of Frederick the Great it has been the policy of the Prussian kings to attract to their capital, either through professorships in the university or otherwise, learned men in every department of knowledge. Consequently, though but a city almost of yesterday, the number of eminent men who have laboured, or who still labour, within the walls of Berlin is very great. Of those who are world-renowned may be named Leibnitz, who founded the Academy of Sciences, and became its first president; the philosophers Fichte, Schleiermacher and Hegel; the theologians Neander, De Wette, and Hengstenberg; the historians Ranke, Von Raumer, and Mommsen; the philologists Bopp and the brothers Grimm. In the natural sciences Alexander von Humboldt, and after him many brilliant names, down to those of Virchow and Koch. It may suffice, further, to name the poets Tieck and Rückert, the famous sculptors Rauch and Schadow, and the composers Felix

Mendelssohn and Meyerbeer. Berlin being the capital of Germany, government officials, people of wealth and education, &c., form an important element of the population. Music is extensively and successfully cultivated by the Berliners. The performance of sacred vocal music, in particular, has attained extraordinary perfection. The opera and theatres are on the most flourishing footing, and are liberally encouraged, the taste for such entertainments pervading all classes.

The manufactures of Berlin are various and extensive. The most important branch of manufacturing industry is that of steam-engines and other machinery (employing over 15,000 hands). Brass-founding, the making of lamps and other articles of metal, are also largely carried on; while next in order come such industries as printing and the kindred arts, spinning and weaving, the making of sewing-machines, paper, tobacco and cigars, pottery and porcelain, pianos and harmoniums, artificial flowers, brewing, &c. A considerable quantity of the manufactures are exported. In the royal iron-foundry busts, statues, bas-reliefs, &c., are cast, together with a great variety of ornaments of unrivalled delicacy of workmanship.

Berlin is well supplied with city and other railways. It has tramways on which the motive power is partly horses, partly steam, and partly electricity. There are elevated and other city lines, including an elevated electric line, and a circular line. Berlin is an important railway centre, not only for Germany but for a great part of Europe, being on the main routes from Paris and London to St. Petersburg and Moscow, and on those from Northern Europe to Vienna, Constantinople, and Italy.

History.—The oldest parts of the city are Kolln and Berlin proper, which were originally poor villages inhabited by fishermen, and first rose to some importance under Markgraf Albert (1206–20), the grandson of Albert the Bear. The Elector Frederick II. with the Iron Teeth built a castle at Kolln on the banks of the Spree in 1442; and from the time of John Cicero the town became the permanent residence of the electors. About two centuries ago Berlin was still a place of little importance. It was confined to the immediate bank of the Spree and the island which divides its channel, and consisted of a series of villages, which gradually merged into each other, and gave their names to different quarters. The first important improvement was made by the great elector Frederick William, who planted the Unter den Linden, and otherwise enlarged and beautified the town; so that in his time it already numbered 20,000 inhabitants. He may be considered the second founder of the city. His successor, King Frederick I., seconded his efforts; but Berlin never assumed the appearance of a capital till the time of Frederick the Great, who, determined to make it worthy of his extended dominions, inclosed a large space within the walls, and proceeded to build upon it, to supply the wants, not so much of actual, as of an anticipated population. He was twice interrupted in the work, and almost driven from this purpose, when in 1757 the city fell into the hands of the Austrians, and in 1760 into those of the Austrians and Russians. But he soon repaired the damage; and his successors having followed in his steps, Berlin has rapidly risen to be the first city in Germany in respect of population, architecture, and political influence. Pop. in 1846, 408,602; in 1885, 1,815,287; in 1895, 1,677,804; in 1900, 1,884,151.

BERLIN, a four-wheeled carriage consisting of an inclosed fore portion for two occupants, and a back seat with a calash top for servants. It was invented in Berlin.

BERLIN, TREATY OF, the treaty signed July 18th, 1878, at the close of the Berlin Congress, which was constituted by the representatives of the six great powers and Turkey. The treaty of San Stefano previously concluded between Turkey and Russia, was modified by the Berlin treaty, which resulted in the division of Bulgaria into two parts, Bulgaria proper and Eastern Rumelia, the cession of parts of Armenia to Russia and Persia, the independence of Roumania, Servia, and Montenegro, the transference of Bosnia and Herzegovina to Austrian administration, and the retrocession of Bessarabia to Russia. Greece was also to have an accession of territory. The British representatives were Beaconsfield, Salisbury, and Lord Odo Russell. By a separate arrangement previously made between Britain and Turkey the former got Cyprus to administer.

BERLIN SPIRIT, a coarse spirit distilled from potatoes, beets, &c.

BERMONDSEY, a mun. bor. of London, in Surrey, also a division of the parl. bor. of Southwark. It has leather manufactures, tanneries, &c. Pop. mun. bor. (1901), 180,486; parl. div. 81,987.

BERMUDA GRASS, *Cynodon dactylon*, a grass cultivated in the West Indies, United States, &c., a valuable fodder grass in warm climates. It is found also on the southern coasts of England.

BERMUDAS, or SOMERS ISLANDS, a cluster of small islands in the Atlantic Ocean, belonging to Britain, and situated 580 miles S.E. of Cape Hatteras. They are in number about 400, but for the most part so small and so barren that they have neither inhabitants nor name. They were first discovered by Juan Bermudez, a Spaniard, in 1522; in 1609 Sir George Somers, an Englishman, was wrecked here, and, after his shipwreck, formed the first settlement. The most considerable of these islands are St. George, Bermuda or Long Island (with the chief town, Hamilton, forming the seat of the governor), Somerset, St. David's, and Ireland. They are chiefly used as a naval and military station. The island of Ireland is occupied by a government dockyard and other naval establishments, while Boaz and Watford Islands have the military depôts. The military headquarters are at Prospect. An immense iron floating-dock was launched on the Tyne for the Bermudas in 1902; it is capable of receiving a vessel of 17,500 tons. The climate is generally healthy and delightful, the air being mild and moist at all seasons. It is not adapted, however, for consumptive patients. The thermometer seldom falls below 40° Fahr., and rarely rises above 85°. These islands have, therefore, become a popular holiday resort for Americans, and plentiful hotel accommodation is supplied at St. George's and Hamilton. The surface is rather irregular; the soil, though light and stony, is in general rich and fertile. The islands form a nearly continuous chain, and are connected almost uninterruptedly by roads, bridges, and causeways. The water is in general salt; there is but little fresh except rain-water, preserved in cisterns. The inhabitants export early potatoes, onions, lily bulbs, &c., nearly all of these products being shipped to New York. The value of the exports is from £120,000 to £180,000 annually, that of the imports is about £300,000 to £320,000. The revenue is about £34,000. Pop. (1897), 16,098.

BERN, the chief canton of Switzerland, with a capital of the same name, and an area of 2657 square miles, is situated in the western half of the confederacy, and is surrounded by the cantons of Neuchâtel, Freiburg, Vaud, Valais, Uri, Unterwalden, Lucerne, and Solothurn, being partly bounded also by France and Alsace. It mainly belongs to the basin of the Rhine, its chief river being the

Aar, but a small portion in the south-west is drained by the Doubs, a tributary of the Rhone. It may be divided into the region of the Jura on the north-west, the Alps on the south, and the hilly table-land between. The more northern portion of the canton has beautiful plains and valleys, and a fertile and highly-cultivated soil, producing corn, wine, and fruits. Here is situated the Emmenthal, one of the richest and most fertile valleys in Switzerland, where the finest cattle are raised, and a well-known kind of cheese made. The southern portion of the canton, the Bernese Oberland (Upperland), to which the valleys of Haali, Grindelwald, Lauterbrunnen, &c., belong, begins at the foot of the high mountain chain between this canton and that of the Valais, and extends to its summit. The lower valleys produce good fruits, and are fertile and agreeable; higher up are excellent Alpine pastures; then succeed bare rocks, extensive glaciers (the source of magnificent streams and waterfalls), and some of the highest mountains of Switzerland, as the Finsteraarhorn, the Schreckhorn, and Wetterhorn, the Eiger, the Jungfrau. The inhabitants of the Oberland live principally by raising cattle. The chief trade is in linen and woollen manufactures, especially in the Emmenthal. Pop. (1897), 648,061.

After belonging to the Franks and Burgundians the Bernese territory became part of the German Empire. The city was founded in 1191, and in 1218 the Emperor Frederick II. declared it a free city of the empire and confirmed its privileges by a charter, which is still preserved. In 1353 it entered into the Helvetic Confederacy. In 1405 the greater part of the city was destroyed by fire, but it was afterwards regularly rebuilt. The long wars with Austria, Milan, Burgundy, and Savoy soon after broke out, from which the Confederacy came off victorious, and in which Bern conquered Aargau. In 1528 the citizens of Bern embraced the cause of the Reformation. In the subsequent war with the Duke of Savoy they conquered the Pays de Vaud. From that time till 1798 the prosperity and wealth of Bern constantly increased, so that the canton then contained above 5000 square miles and about 380,000 inhabitants. On March 5th, 1798, 30,000 French troops marched against Bern and conquered it, the result being that it now lost about half of its possessions—the northern part was united with the present canton of Aargau, and out of the south-western (Pays de Vaud) the present canton of Vaud was formed. By the decrees of the congress at Vienna, however, the greater part of the bishopric of Basel was joined to the canton. The present constitution dates from 1893, and is purely democratic. The legislative power is vested in a great council elected by the people voting in 62 electoral districts, there being one member for every 3000 inhabitants. The executive is vested in a governing council of nine members elected by the great council, both being chosen for four years. The referendum is in force, and all laws may be submitted to popular vote before they become valid. The 'initiative' or right to propose new measures may be exercised by 12,000 voters acting together, but a demand for revision of the constitution must be supported by 15,000 voters.

BERN, a town in Switzerland, capital of the canton of the same name (see above) and of the whole confederation. Apart from modern suburban quarters, it stands on an elevated rocky peninsula, washed on three sides by the Aar, which is crossed by several bridges, including the handsome Nydeck Bridge, the huge iron Kirchenfeld Bridge, and the Kornhaus Bridge (opened in 1898), with a roadway 160 feet above the Aar, and a principal arch of 380 feet span. The streets are, for the greater part, straight, wide,

and well paved; and the houses, partly provided with piazzas, are substantially built of stone. The streets are purified by fountains and adorned with fountains. Among the public buildings are the great Gothic cathedral, built between 1421 and 1573, restored 1850, with a spire 190 feet high; the Church of the Holy Spirit; the university, with a full equipment of professors in all the different faculties and arts; the hall of the Swiss Federal Council; the art museum, containing the municipal picture-gallery; the handsomely-built hospital; the town-house, a Gothic edifice of the fifteenth century, restored 1868; the mint; the corn hall, formerly used for storing grain in case of scarcity; the historical and archaeological museum; the natural history museum; the observatory, the deaf and dumb institution, the infirmary, the orphan and lunatic asylums. The public library possesses great treasures, both of printed books and manuscripts. Trade and commerce are lively; the manufactures consist of woollens, cottons, silks, machinery, chocolate, &c. There are few cities with finer promenades and ornamental grounds, or where they are kept in better repair. From many points there are magnificent views, the panorama of the Bernese Alps presenting a sublime spectacle when seen under favourable conditions. The bear, as the heraldic emblem of Bern, figures frequently in a sculptured form; and a number of these animals in the flesh are kept at the cost of the municipality. There is a curious clock tower containing mechanism by which the striking of the hours is heralded by the crowing of a cock and a procession of bears. Pop. (1897), 49,080.

BERNADOTTE, JEAN BAPTISTE JULES, a French general, afterwards raised to the Swedish throne, was the son of an advocate of Pau, and born there on 26th January, 1764. He enlisted at the age of seventeen in a regiment of marines. His progress was at first slow, but after 1790, when he was made a subaltern, his promotion was rapid. In 1794 he was appointed a general of division, and distinguished himself greatly in the campaign in Germany and on the Rhine. After the battle of Neuwied he was introduced for the first time to Bonaparte, who conceived the highest opinion of his abilities, though a constant suspicion of Napoleon seems always to have been present in the mind of Bernadotte. In 1798 he married Mademoiselle Clary, sister-in-law of Joseph Bonaparte. The following year he became minister of war, but was shortly obliged to resign office. On the establishment of the empire Bernadotte was created marshal of France and Prince of Ponte-Corvo. Being now placed at the head of an army of observation stationed in the N. of Germany, he fixed his headquarters at Hamburg. At this time Gustavus IV. had been driven from the throne of Sweden. The Duke of Sudermania assumed the reins of government under the name of Charles XIII.; and as he was far advanced in years, the diet had nominated, as his successor, the Prince of Holstein-Augustenburg, when the latter died in a mysterious manner. The heir-apparent to the Swedish crown was then offered to the Prince of Ponte-Corvo. This offer was accepted by Bernadotte, with the consent of the emperor; and in October, 1810, he arrived in Sweden, where, having previously abjured the Roman Catholic religion, he was proclaimed heir-apparent to the throne, under the title of Prince Charles John. He had not long been established in this dignity before serious disagreements took place between him and Bonaparte, whose blockade of the continental ports was very detrimental to the commercial interests of Sweden. The result was a complete rupture, and the accession of Sweden in 1812 to the coalition of sovereigns formed against Napoleon.

At the battle of Leipzig-Prince Charles John contributed effectually to the victory of the allies. On the general re-establishment of the European dynasties at the termination of the war, strenuous, but unsuccessful, attempts were made by the Emperor of Austria and other sovereigns to restore the family of Gustavus IV. to the crown; and Bernadotte, retaining his position as crown-prince, became King of Sweden on the death of Charles XIII. in 1818, under the title of Charles XIV. During his reign agriculture and commerce made great advances, and many important public works were completed; among others, the Götha Canal. He died on 8th March, 1844, and was succeeded by his son Oscar, father of the present sovereign, Oscar II.

BERNARD, CLAUDE, celebrated French physiologist, was born at Saint-Julien, in the department of the Rhône, on July 12th, 1813, and died at Paris on Feb. 10th, 1878. Educated at Villefranche and Lyons, he went to Paris in order to devote himself to a literary career, but soon turned to medicine. In 1839 he became assistant to Magendie, who directed his attention to experimental physiology. He became professor at the Collège de France in 1856, and about the same time he was appointed to the chair of experimental physiology at the Sorbonne. In 1868 he resigned the latter chair in order to take up a similar one in the Museum of Natural History, and in that year also he was elected to Florens's place in the Academy. He was one of the foremost physiologists of his age, and several important discoveries are associated with his name. Among his published works are *Leçons de Physiologie Expérimentale appliquée à la Médecine* (1854-55); *Leçons sur la Physiologie et la Pathologie du Système Nerveux* (1858); *Leçons sur les Propriétés Physiologiques et les Altérations Pathologiques des Liquides de l'Organisme* (1859); *Leçons sur les Propriétés des Tissus Vivants* (1866); *Leçons de Pathologie Expérimentale* (1871); *Physiologie Générale* (1872); *Leçons sur la Chaleur Animale* (1876); *Leçons sur les Phénomènes de la Vie, communs aux Animaux et aux Végétaux* (1878-79); *La Science Expérimentale* (1878); *Leçons de Physiologie Opératoire* (1879), &c. He was accorded a national funeral.

BERNARD, GREAT ST., a celebrated pass of the Pennine Alps, in Switzerland, in the canton Valais, on the mountain-road leading from Martigny to Aosta in Piedmont. On the E. side of the pass is Mount Velan, and on the W. the Pointe de Dronaz; there is no mountain known by the name of St. Bernard. Almost on the very crest of the pass is the famous Hospice, among the highest permanently inhabited spots in Europe, 8200 feet above the level of the sea. There is a massive stone building, capable of accommodating seventy or eighty travellers with beds and of sheltering 300. As many as 500 or 600 have received assistance in one day. It is situated on the highest point of the pass, exposed to tremendous storms from the N.E. and S.W., and is tenanted by ten or twelve brethren of the order of St. Augustine, who have devoted themselves by vow to the aid of travellers crossing the mountains. The climate of this high region is necessarily rigorous. There is a lake on the summit, at a short distance from the Hospice, on which ice has frequently remained throughout the whole year. The severest cold recorded is 29° below zero, Fahr., but it has often been 18° and 20° below zero; the greatest summer heat recorded is 68° Fahr. From the difficulty of respiration in so elevated a locality, and the severity of the climate, few of the monks survive the time of their vow, fifteen years from the age of eighteen, when they are devoted to this service. The dogs kept at St. Bernard to assist the brethren in their humane labours are well known.

In the midst of tempests and snowstorms the monks, accompanied by some of these dogs, set out for the purpose of tracking those who have lost their way. If they find the body of a traveller who has perished they carry it into the vault of the dead, where it is wrapped in linen, and remains lying on a table till another victim occupies the place. It is then set up against the wall among the other dead bodies, which, on account of the cold, decay so slowly that they are often recognized by their friends after the lapse of years. Adjoining this vault is a kind of burying-ground, where the bones are deposited when they accumulate too much in the vault. It is impossible to bury them, because there is nothing around the Hospice but naked rocks. The institution is supported partly by its own revenues, partly by subscriptions and donations. The Pass of St. Bernard appears to have been known at a very early period; and a Roman road led down the Piedmontese side of the mountains. The remains of a massive pavement are still visible; and the cabinet of the Hospice contains votive tablets, bronze figures, and other antiquities found in the vicinity. The Hospice was founded in 962 by St. Bernard of Menthon, an Italian ecclesiastic, for the benefit of those who performed pilgrimages to Rome. In May, 1800, Napoleon led an army of 30,000 men, with its artillery and cavalry, into Italy by this pass.

BERNARD, LITTLE ST., a mountain of Italy, belonging to what are called the Graian Alps, about 10 miles S. of Mont Blanc. It stands between Savoy and Piedmont, having the valley of the Isère, in the former, on the W., and that of the Doire, in the latter, on the E. The pass across it is one of the easiest in the Alps, and is supposed by many to be that which Hannibal used. The Hospice, at the summit of the pass, has an elevation of 7192 feet.

BERNARD OF CHARTRES, surnamed *Sylvestris*, a writer of the twelfth century, has been lauded as the ablest Platonic of his time, and wrote two works, now lost, in one of which he endeavoured to reconcile Plato and Aristotle, and in the other he maintained the doctrine of a Providence, and proved that all material beings, possessing a nature subject to change, must necessarily perish. Another work under the name of Bernard Sylvestris still exists, and is composed of two parts, distinguished by the names of *Macrocosmus* and *Microcosmus*, or the Great World and the Little World. He reduces all things to two elements—matter and ideas. Matter is itself devoid of form, but susceptible of receiving it; ideas reside in the divine intellect, and are the models of life, and from their union with matter all things result. M. Cousin has published extracts from these works.

BERNARD, SAINT, OF CLAIRVAUX, one of the most influential ecclesiastics of the middle ages, was born at Fontaine, in Burgundy, 1091, of a noble family. In 1113 he became a monk at Cîteaux; in 1116 first abbot of Clairvaux, near Langres. An austere manner of living, solitary studies, an inspiring eloquence, boldness of language, and the reputation of a prophet, rendered him an oracle to all Christian Europe. He principally promoted the crusade in 1146, and quieted the fermentation caused at that time by a party of monks against the Jews in Germany. He declined all promotion, and in the rank of abbot of his beloved *Jervusalem* (as he used to call Clairvaux) he continued with all humility, but with great boldness, his exhortations of the clergy and his counsels to the pope. Innocent II. owed to him the possession of the right of investiture in Germany, and Eugenius III. his education. He was, at the same time, the umpire of princes and bishops, and his voice in the synods was regarded as divine. By his rigid orthodoxy and his remarkable eloquence, which were always directed to the promotion of

practical Christianity, he refuted the subtleties and dialectics of the scholastic philosophers, although his severity against Abelard and Gilbert of Porée can by no means be justified. Luther says of him, 'If there has ever been a pious monk who feared God, it was St. Bernard; whom alone I hold in much higher esteem than all other monks and priests throughout the globe.' Bernard died in 1153, and was canonized by Alexander III., in 1174. St. Bernard's *Meditations* was one of the books printed by Wynkyn de Worde (1496). The best edition of his works is that of Mabillon (Paris, 1690, two vols.; reprinted, Paris, 1829-40).

BERNARDIN DE ST. PIERRE. See **PIERRE** (St.)

BERNARDINE MONKS. See **CISTERCIANS.**

BERNARDO DEL CARPIO. A famous hero, to whom the romancers, and even historians of Spain, have attributed many fabulous exploits, was born in the ninth century, the fruit of a secret marriage between Chimena, the sister of Alphonso the Chaste, and of Don Sancho, lord of Saldagua. Alphonso, irritated at the marriage, put out the eyes of Don Sancho, and imprisoned him in a castle, but spared Bernardo, and brought him up carefully at his court. In course of time Don Bernardo grew up to be a warrior, and distinguished himself in the Moorish wars, in the hope that the king would be bent to pity and set his father at liberty. Alphonso was inflexible, and Bernardo withdrew to his paternal domains; and, leaguings with other lords opposed to the court, set him at defiance. On the accession of Alphonso the Great, Bernardo returned to court, and again performed many exploits against the Moors, hoping to be rewarded with his father's freedom. He was once more denied the boon, and withdrew as before, not only leaguings with his friends, but making alliance with the Moors. Alphonso agreed at length to give up his father, on receiving the surrender of the castle of Carpio. Bernardo, true to his word, performed his part of the stipulation, and then learned with indignation that Alphonso had practised an infamous deception upon him, as his father had been for some time dead. He disdained any longer to tread the Spanish soil, and removed to France, where he spent the remainder of his life as a knight errant.

BERNAUER, AGNES, a Bavarian lady, celebrated for her beauty and her unfortunate fate. Agnes was born in humble life. She was the daughter of a poor citizen, said to be a barber of Augsburg. The exact time of her birth is not known; her death occurred on 2d October, 1485. Her story, though well authenticated, has become legendary from the interest attached to it, and is a favourite theme with the Bavarian poets.

Duke Albert of Bavaria, only son of the reigning prince, met Agnes at a tournament given in his honour by the grandees of Augsburg, became enamoured of her, and as he could not prevail on her to be his mistress, secretly married her. He conducted her to his own castle of Vohburg, and for a time succeeded in concealing the alliance he had contracted; but his father wishing to marry him to Anne, daughter of the Duke of Brunswick, he was compelled to acknowledge his marriage with Agnes. His father refused to credit it, and having caused the duke to be denied admission to a tournament on the plea that he was living unlawfully with a woman, Albert openly proclaimed his marriage, and caused Agnes to be recognized as Duchess of Bavaria, giving her for residence the castle of Straubing on the Danube. The Duke of Bavaria, incensed at this open avowal of a misalliance, caused Agnes to be seized in her castle during the absence of his son, brought her

before a tribunal specially constituted, where she was accused of magic, and being condemned, had her hands tied together, and was thrown into the river. Albert in revenge took arms against his father, but the Emperor Sigismund finally reconciled them. The Duke Ernest raised a challenge to the memory of Agnes, and Albert married the Princess of Brunswick.

BERNAY, a town in France, in the department of Eure, 25 miles N.W. from Evreux, agreeably situated on the right bank of the Charentonne. It has two fine old churches, a communal college, a hospital, a court of first resort, a board of manufactures, an agricultural society, and a savings-bank. It has important manufactures of cloth and flannel, tape, linen, and cotton goods; and spins a good deal of cotton, thread, and worsted. It has also bleachfields, dyeworks, tanneries, &c. Trade principally in grain, cider, cloth, iron, paper, leather, linen, horses, and cattle. The horse-fair, held in Lent, is one of the greatest in France, and is attended by purchasers from all parts of the country to procure post and diligence horses, for which Normandy has long been celebrated. Pop. (1891), 5788.

BERNBURG, a town of Germany, in the duchy of Anhalt, capital of the former duchy of Anhalt-Bernburg, on both sides of the Saale, N.W. from Leipzig, with which, as well as with Berlin and Magdeburg, it is connected by railway. It is divided into the old, the new, and the high town; the first two surrounded by walls, and communicating by a bridge 173 feet long. Bernburg is well built, and contains several well-paved and well-lighted streets. The principal building is the palace, situated, with a garden, on the highest part of the high town. It is very ancient, but has received numerous modern additions, and contains a picture-gallery, theatre, and church. Besides an oil-mill, and several breweries and distilleries, there are manufactures of paper and earthenware, copper and tin wares, &c. Pop. (1895), 32,374.

BERNERS, or BARNES, JULIANA, an English lady of the fifteenth century, of whom little more is known than that she was prioress of the nunnery of Sopewell, near St. Alban's, and has her name prefixed as the writer or compiler to one of the earliest and most curious productions of the English press. The first edition (of which only three perfect copies are known), printed in the abbey of St. Alban's in 1486, treats of hawking, hunting, and heraldry, to which, in the second edition, printed by Wynkyn de Worde in 1496, is added a section on angling. This work, under the title of the *Book of St. Alban's*, became a popular manual of sporting science, and was many times reprinted in the sixteenth century. It has latterly been issued in fac-simile of the original print.

BERNHARD, Duke of Weimar, general in the Thirty Years' war, born Aug. 6, 1604, the fourth son of Duke John of Saxe-Weimar, entered into the service of Holland, at that time the best school for a soldier, where Prince Maurice of Nassau (the creator of a better system of tactics), his brother Frederic Henry, the Marquis Spinola, and other great generals, were opposed to one another. Bernhard afterwards entered the Danish army employed in Holstein against the troops of the emperor, and commanded by the Margrave of Baden Durlach, and was present at the conference of Lubeck, 1629, for negotiating peace. When Gustavus Adolphus entered Germany Bernhard joined him, and was present at the attack upon Wallenstein's camp in the neighbourhood of Nuremberg, Aug. 24, 1632. In the battle of Lützen, Oct. 6, 1632, he commanded the left wing of the Swedish army, avenged the death of Gustavus Adolphus, and, although himself severely wounded, put the right wing of the imperial troops to flight. Chancellor

Oxenstiern, the Swedish director of the war in Germany, after the death of the king, committed the command of half the army to him. Bernhard in 1633 took Bamberg, Cronach, Höchstädt, and Aichstädt; but his attempt upon Ingolstadt miscarried. He also brought the cities of Ratibon and Straubing into his power, and frustrated Wallenstein's intentions. The King of Sweden made him Duke of Franconia. His impetuosity caused the defeat at Nordlingen (which see), August 24, 1634. He himself narrowly escaped being made prisoner. The prudence of Oxenstiern, and the valour of Bernhard, soon made amends for this fault. France, now entering into a closer alliance with Sweden, concluded a separate treaty with Bernhard, who went to Paris, Oct. 16, 1634. Bernhard promised for 4,000,000 livres to raise an army of 18,000 men on the Rhine to act against Austria. He now carried on the war in the country adjacent to the Rhine, took the fortress of Zabern in Alsace, spread his army over Lorraine and Burgundy, and vanquished the forces of the emperor in several battles. At the commencement of the year 1638 he laid siege to Rheinfelden not far from Basel. Here he was unexpectedly attacked in his camp, February 18, by an Austrian army that had advanced to raise the siege. Bernhard was obliged to retreat before superior numbers; but, having soon collected his forces, he attacked the Austrians by surprise, February 21, and obtained a complete victory. Several Austrian generals were made prisoners, and the fortress of Rheinfelden was obliged to surrender, May 13. He then undertook the siege of Breisach, the possession of which was necessary for maintaining himself in Alsace. An imperial army, under the command of General Götze, that approached with the intention of raising the siege, was defeated with a great loss by Bernhard, July 30. Bernhard captured several places of inferior importance during the siege of Breisach, which, however, did not surrender until he had repeatedly defeated the Austrians, and then upon very moderate conditions, which Bernhard signed in his own name without mentioning France. The possession of Alsace, which he had before ceded to France under certain conditions, was now secured; but he also demanded Breisach as an appurtenance to Alsace. He garrisoned all the conquered places with German troops, and ordered money to be coined with the Saxon coat of arms and that of Breisach. In vain were the efforts of France to deprive the duke of the possession of Breisach by proposing to place a French garrison in the fortress: the duke declined not only this proposal, but also an invitation to Paris, and the offer of a marriage with the Duchess d'Aiguillon, niece of Cardinal Richelieu. Instead of that match, he proposed one with the Princess of Rohan, to which, however, the French court would not accede, lest the party of the Huguenots should be strengthened. It is probable that Richelieu had recourse to secret means in order to rid France of the duke, who was become formidable by his growing power. He was suddenly seized with a disorder which terminated his life, July 8, 1639. Most of the contemporary writers conjectured that Richelieu caused him to be poisoned: the duke himself had no doubt that he had swallowed poison. Immediately after his death several French commissioners appeared, who enlisted his troops into the French army: the command of them was committed to Marshal Guebriant. With Bernhard fell one of the chief supports of the Protestants. His successors, Banér and Torstensson, pursued his victorious course, and France seriously exerted herself in the war which continued for the benefit of the Protestants. In Bernhard a graceful person, intelligence, and valour were united with a magnanimity

which could not be shaken by adverse events: his only fault was too great impetuosity.

BERNHARDI, AUGUST FRIEDRICH, a German scholar, born in Berlin in 1768, died there in 1820. In his youth his attention was directed to universal language (that is, to language as far as it is common to all rational beings), to the mystery of its construction, the mathematics, as it were, of language. Bernhardt, considering all different languages as a whole, endeavoured to discover a universal grammar common to them all. The result of his researches appears in his works, *Reine Sprachlehre* (Abstract Grammar), 1801, two vols.; *Angewandte Sprachlehre* (Grammar in its Application), 1803; and *Anfangsgründe der Sprachwissenschaft* (Elements of the Science of Language), in which many philosophical principles of language are laid down. Bernhardt was a man of cultivated mind and extensive knowledge. He was also a professor and director of a classical school in Berlin.

BERNI, FRANCESCO (also BERNA, and BERNIA), a poet of the sixteenth century, born at Lamporecchio, in the territory of Tuscany, towards the close of the fifteenth century, of a noble but poor Florentine family, went to Florence, and at the age of nineteen to Rome, where he lived under the care of his relation, Cardinal Bibiena, who, as he himself says, did him neither good nor harm, and he was at length obliged to enter the service of the Bishop of Verona, Ghiberti, datary of the papal chancery, as secretary. In the hope of promotion he took orders; but disgusted with the duties of his office, he sought recreation in amusements which displeased the prelate. A society had been established at Rome, consisting of young ecclesiastics of a jovial temper like Berni, and a poetical vein, who, in order to denote their love for wine and their careless gaiety, called themselves *vignajuoli* (vine-dressers). Mauro, Casa, Frenzuola, Capilupi, &c., were of the number. They laughed at everything, and made sport in verse of the most serious, nay, the most tragic matters. Berni's verses were the most successful, and were written in so peculiar a style, that his name has been given to it (*maniera Bernesca* or *Bernesca*). When Rome was sacked by the troops of the Constable Bourbon, 1527, Berni lost all that he possessed. He afterwards made several journeys, with his patron Ghiberti, to Verona, Venice, and Padua. At length, wearied with serving, and satisfied with a canonship in the cathedral at Florence, in the possession of which he had been for some years, he retired to that place. The favour of the great, however, which he was weak enough to court, brought him into difficulties. He was required to commit a crime, and his refusal cost him his life. Alessandro de' Medici, at that time Duke of Florence, lived in open enmity with the young Cardinal Ippolito de' Medici. Berni was so intimate with both, that it is doubtful which first made him the proposal to poison the other. Certain it is that the cardinal died by poison in 1535. Berni died July 26, 1536; and if, as is asserted, his life was terminated by poison, then the crime must be imputed to Duke Alessandro.

In the burlesque style of poetry, Berni is still considered the best model. His satire is often very bitter, and frequently unites the good humour of Horace with the causticity of Juvenal. The extreme licentiousness of his writings is his greatest fault. It should, however, be considered that he wrote for his friends only, and that his works were not printed until after his death. The admirable ease for which his writings are distinguished, was the result of great efforts, since he repeatedly amended and corrected his verses. The same is asserted of Ariosto; and yet they are the most distinguished among the Italian

poets for the ease and fluency of their style. Berni also wrote Latin verses very correctly, and was well acquainted with Greek. His *Rime Burlesche* (Burlesque Verses) have great merit; so also has his *ricicamento* of Bojardo's Orlando Innamorato.—Another Berni (COUNT FRANCESCO BERNI, who was born in 1610, and died in 1678) has written eleven dramas and also several lyric poems.

BERNIER, FRANÇOIS, born at Angers, in Anjou, about 1625, studied medicine, and after taking his degree at Montpellier, set out on his travels in 1654, and after visiting Egypt and Palestine, went into India, where his skill in medicine brought him into notice; and he remained for twelve years, residing chiefly at Delhi, as physician to the Great Mogul emperor Aurungzebe. On one occasion he accompanied the prime-minister on his march, at the head of an immense army, to the conquest of Cashmere, and in his travels, recording all that he saw, has given accounts full of interest, and recognized by subsequent travellers as remarkable for their fidelity. After his return to France he not only compiled his *Travels* and several volumes of history relating to the empire of the Great Mogul, but turned his attention to philosophical subjects, and published an abridgment of the philosophy of Gassendi. He also wrote a treatise, entitled *Traité du Libre et du Volontaire*. He died at Paris in 1688.

BERNINI, GIOVANNI LORENZO, called *il cavaliere Bernini*, born in Naples, 1598, is praised by his contemporaries as the Michael Angelo of modern times, on account of his success as a painter, a statuary, and an architect; but he deserves his fame principally in the latter character. Richly endowed by nature, and favoured by circumstances, he rose superior to the rules of art, creating for himself an easy manner, the faults of which he knew how to disguise by its brilliancy. From his early youth he manifested a great power to excel in the arts of design, and at the age of eight years executed the head of a child in marble, which was considered a remarkable production. That such rare endowments might be suitably cultivated, his father carried him to Rome. One of Bernini's first works was the marble bust of the prelate Montajo; after which he made the bust of the pope, and of several cardinals; also sundry figures of the natural size. He was not yet eighteen when he produced the Apollo and Daphne, in marble, a master-piece of grace and execution. Looking at this group near the close of his life, he declared that he had made very little progress since the time when that was produced. His manner was indeed more chaste and less affected in the early part of his career than at a later period. After the death of Gregory XV., Urban VIII., his successor, employed Bernini to prepare plans for the embellishment of the Basilica of St. Peter's, assigning to him a monthly pension of 300 crowns, which was afterwards augmented. Without forsaking sculpture, Bernini's genius embraced architecture, and he furnished the design for the canopy and the pulpit of St. Peter's, as well as for the circular place before the church. Among his numerous works were the palace Barberini, the belfry of St. Peter's, the model of the monument of the Countess Matilda, and the monument of Urban VIII., his benefactor.

In the year 1644 Cardinal Mazarin, in the name of the King of France, offered him a salary of 12,000 crowns; but he declined the invitation. Urban had scarcely closed his eyes, and Innocent X. ascended the papal throne, when the envy engendered by the merits of the artist and the favour bestowed on him broke forth. His enemies triumphed; but he retained the favour of the pope by a model for a fountain. About the same time he erected the palace of

Monte Citorio. Alexander VII., the successor of Innocent X., displayed much taste for the arts, and favour to this artist, and required of him a plan for the embellishment of the Piazza di San Pietro. The admirable colonnade, which is so beautifully proportioned to the Basilica, was built under the direction of Bernini. We may also mention the palace Odescalchi, the Rotunda della Roccia, the house for novices, belonging to the Jesuits, on Monte Cavallo, &c. Louis XIV. having invited him, in the most flattering terms, to Paris, he set out from Rome, in 1665, at the age of sixty-eight, accompanied by one of his sons and a numerous retinue. Never did an artist travel with so great pomp and under such flattering circumstances. The reception which he met with in Paris was highly honourable. He was first occupied in preparing plans for the restoration of the Louvre, which, however, were never executed. But notwithstanding the esteem which he enjoyed in Paris, some disagreeable circumstances induced him to return to Rome. He left Paris loaded with presents. Cardinal Rospigliosi having become pope, Bernini was admitted to an intimate intercourse with him, and charged with several works; among others, with the decoration of the bridge of St. Angelo. In his seventieth year this indefatigable artist executed one of his most beautiful works, the tomb of Alexander VII. He still continued to devote himself to several works of architecture, as well as of statuary, with such ardour that, exhausted by his labours, he died Nov. 28, 1680, at the age of eighty-two. He was buried with great magnificence in the church of St. Maria Maggiore. To his children he left a fortune amounting to about 8,300,000 francs. Bernini's favourite maxim was, *Chi non esce talvolta della regola, non passa mai*. Thus he was of opinion that, in order to excel in the arts, one must rise above all rules, and create a manner peculiar to one's self. This Bernini has accomplished with a rare good fortune, but the influence of his style has been transient. His most eminent disciples are Pietro Bernini, his brother, a statuary, architect, and mathematician; Matthias Rossi, François Duquesnois, surnamed *the Fleming*, and Borromini.

BERNIS, FRANÇOIS JOACHIM DE PIERRES DE, cardinal, and minister of Louis XV., was born at St. Marcel de l'Ardeche in 1715, of an ancient family, but little favoured by fortune, for which reason his parents destined him for the clerical profession. Madame de Pompadour presented him to Louis XV., who, being pleased with him, assigned to him an apartment in the Tuilleries, with a pension of 1500 livres. His wishes were directed towards raising his income to 6000 livres. Not succeeding, however, in attaining this moderate fortune, he resolved to aim at a larger one. He went as ambassador to Venice, and obtained great respect in this difficult post. After his return he enjoyed the highest favour at court, and soon became minister of foreign affairs. The political system of Europe was changed at that time. France and Austria, hitherto enemies, united in an offensive and defensive alliance, which was succeeded by the Seven Years' war, so unfortunate for France. Bernis has been designated by several writers as the chief author of this alliance. Duclos, however, asserts that it was the intention of Bernis to maintain the old system, which, since the time of Henry IV., and especially since the time of Richelieu, had made France the protectress of the less powerful states of Germany, and the rival of Austria. Oppressed by the misfortunes of his country, which, in part at least, were ascribed to him, Bernis surrendered his post, and was soon after banished from court. His disgrace lasted till the year 1764, when the king appointed him Archbishop of Alby, and, five

years later, ambassador to Rome. Here he remained till his death. In the name of his court, and against his own opinion, he laboured to effect the abolition of the order of the Jesuits. When the aunts of Louis XVI. left France in 1791 they fled to him for refuge, and lived in his house. The revolution deprived him of his fortune, and the means of indulging his generous disposition. He was reduced to a state of poverty, from which he was relieved by a pension from the Spanish court. Bernis died at Rome, Nov. 2, 1794, nearly eighty years old. The easy poetry of youth had procured him a place in the French Academy. He himself is its severest critic. His verses have been reproached with affectation, negligence, and an excess of ornament and mythological images. Voltaire called him *Babet-la-Bouquetière*, from a fat flower-woman who sold her nosegays before the opera-house. Nevertheless, Voltaire had a great esteem for his talents, his judgment, his criticisms, and his character, as is evident from their correspondence (published in 1799 by Bourgoing), which, in every respect, is very honourable to Bernis. Another correspondence, between Bernis and Paris du Verney, appeared in print in 1790. After his death, Azara published his poem *La Religion Vengée* (Religion Avenged), which, though it contains many beautiful verses and sublime ideas, is deficient in fire and animation. A collection of Bernis's works was published in 1797 by Dudit; another edition was published in 1825.

BERNOULLI, or **BERNOULLI**, a family which has produced eight distinguished men, who have all cultivated the mathematical sciences with success. The family, emigrating from Antwerp on account of religious persecutions, under the administration of the Duke of Alva, fled first to Frankfurt, and afterwards removed to Bâle, where it was elevated to the highest dignities of the republic.—1. **JAMES**, born at Bâle, 1654, became professor of mathematics there, 1687, and died 1705. The differential calculus discovered by Leibnitz and Newton was applied by him to the most difficult questions of geometry and mechanics: he calculated the loxodromic and catenary curve, the logarithmic spirals, the evolutes of several curved lines, and discovered the numbers of *Bernoulli*, as they are called.—2. **JOHN**, born at Bâle, 1667, was one of the greatest mathematicians of his time, and the worthy rival of Newton and Leibnitz. He was destined for commerce, but his inclination led him to the sciences, and from the year 1688 he principally devoted himself to medicine and mathematics. To him and his brother James we are indebted for an excellent treatise on the differential calculus. He also developed the method of proceeding from infinitely small numbers to the finite, of which the former are the elements or differences, and called this method the *integral calculus*. In 1690-92, he made a journey to France, where he instructed the Marquis de l'Hôpital in mathematics. At this time he discovered the exponential calculus, before Leibnitz had made any communications respecting it, and made it known in 1697. In 1694 he became doctor of medicine at Bâle, and in 1695 went, as professor of mathematics, to Groningen where he discovered the mercurial phosphorus or luminous barometer, for which he received, from King Frederick I. of Prussia, a gold medal, and was made a member of the Academy in Berlin, afterwards of that in Paris, &c. After the death of his brother in 1705 he received the professorship of mathematics at Bâle, which he held until his death, January 1, 1748.—3. **NICHOLAS**, nephew of the former, born at Bâle in 1687, studied law, but more particularly devoted himself to mathematics; in 1705 went to Groningen to John Bernoulli; returned however with him to Bâle towards the close

of the year, and became there professor of mathematics. He travelled through Switzerland, France, Holland, and England, and in 1718 became a member of the Academies of Science in London and Berlin. On the recommendation of Leibnitz he went as professor of mathematics to Padua in 1716, but returned to his native city in 1722 as professor of logic. In 1731 he became professor of the Roman and feudal law in that place, and died in 1759. The three following were sons of the above-mentioned John Bernoulli.—4. **NICHOLAS**, born at Bâle, 1695, became professor of law there in 1723, and died in St. Petersburg in 1726.—5. **DANIEL**, born at Groningen, February 9, 1700. He studied medicine, in which he took the doctor's degree, and at the same time was engaged in mathematical studies, in which his father had been his instructor. He visited Bâle, Heidelberg, Strasburg, Venice, and Padua. At the age of twenty-four he was offered the presidency of an academy about to be established at Geneva, but in the following year accepted an invitation to St. Petersburg. Accompanied by his younger brother John, he returned to Bâle in 1733; became there professor of anatomy and botany; in 1750 professor of natural philosophy; resigned this place, because of his advanced age, to his brother's son, the younger Daniel Bernoulli, in 1777, and died in 1782. He was one of the greatest natural philosophers as well as mathematicians of his time. At ten different times he received a prize from the Academy of Paris. In 1734 he shared with his father a double prize, given by this Academy for their joint essay on the causes of the different inclinations of the planetary orbits. Most of his writings are contained in the Transactions of the St. Petersburg, Paris, Berlin, &c. Academies, of which he was a member.—6. **JOHN**, born at Bâle in 1710, went to St. Petersburg in 1732, became professor of rhetoric at Bâle in 1743, and in 1748 professor of mathematics. He died in 1790. The two following were his sons.—7. **JOHN**, licentiate of law and royal astronomer in Berlin, was born at Bâle in 1744, and died, 1807, in Berlin, whither he had been invited in the nineteenth year of his age. He had travelled through all the countries of Europe, and lived after 1779 in Berlin, where he had become director of the mathematical department of the Academy. He is the author of numerous works.—8. **JAMES**, was born at Bâle in 1759; went to St. Petersburg, where he became professor of mathematics; married a grand-daughter of Euler, but died in 1789, in the thirtieth year of his age, of an apoplexy, while bathing in the Neva.

BERNSTORFF, the name of a German noble family, many members of which have been distinguished. The most so was **JOHANN HARTWIG ERNST**, count von Bernstorff, Danish statesman under Frederick V. and Christian VII., born in Hanover, May 13, 1712. His father was secretary of state in Denmark. In 1750 he was made member of the council of state, after having served for a long time as foreign minister. He soon became the most influential member of the government, which distinguished itself under his direction by a wise neutrality during the Seven Years' war, and other political disturbances in Europe; by liberal measures for improving the condition of the Danish peasantry, who were even then in a state of bondage; by promoting science, and sending an expedition to Asia, which the famous traveller Niebuhr accompanied. He himself set the example of manumitting the peasants, and gave the fourth part of his income to the poor. By his efforts Denmark acquired Holstein. Bernstorff is described by all historians as a model of wisdom, benevolence, and intelligence. He died Feb. 19, 1772.

BEROALDO, FILIPPO, one of the most celebrated heralds of the fifteenth century, was born at Bologna in 1453; early gave proofs of great abilities and a prodigious memory, and after completing his education opened a school, successively at Bologna, Parma, and Milan, and taught with great success. He afterwards went to Paris, and gave lectures which attracted a numerous audience and greatly extended his fame. His townsmen now became desirous to possess him, and he returned to Bologna, where he spent the remainder of his life as professor of belles-lettres, and died in 1505. He is now chiefly known as the editor of some good editions of the classics, and the author of a curious tract entitled *Declamatio Ebrionis, Scortatoris et Aleatoris*, in which the drunkard, rake, and gambler, represented as three brothers, debate which of them, as being the most vicious, should be excluded from sharing in his father's inheritance.

BEROSUS, according to some a Chaldean by birth, and a priest of the temple of Belus at Babylon, and according to others a contemporary of Alexander the Great, is celebrated both as a historian and an astronomer, though it has been alleged that his name merely has been used for the purpose of giving a reputation to what others had written. His history, giving an account of the Babylonian Chaldeans and their kings, consisted of two books written in Greek, and professed to be founded on the ancient archives of the temple of Belus. It exists only in fragments, which are contained in the writings of Josephus, Eusebius, and others, and are given in a collected form by Richter (Leipzig, 1825). According to Pliny the astronomical observations contained in the works of Berossus extended over a period of 480 years.

BERQUIN, ARNAUD, born at Bordeaux in 1749, first attracted notice by some poems which he entitled *Idylles*, and by several translations from the English under the name of *Tableaux Anglais*, but is best known by his work entitled *Ami des Enfants*, for which he received the prize of the French Academy in 1789, as the most useful work which made its appearance during that year. It has been translated into most European languages, and still continues a standard work for the amusement and instruction of young people. It cannot, however, lay claim to the merit of originality, as both the title and much of the substance are derived from a work in German by Weiss, entitled *Kinderfreund*. Berquin, though specially devoted to the instruction of youth, was not incapable of excelling in graver literature, and was for some time the editor of the *Moniteur*. In 1791 he was one of the candidates for the office of tutor to the dauphin, the son of Louis XVI. and Marie Antoinette, but died before the decision was given.

BERRI, or **BERRY**, before the revolution of France, a province and dukedom of that country, of which Bourges was the capital, almost in the centre of France. With the exception of the arrondissement St. Amand, which belonged to the Bourbonnais, it now forms the departements Indre and Cher.

BERRI, or **BERRY**, **CHARLES FERDINAND**, DUKE OF, second son of the Count d'Artois (afterwards Charles X.) and Maria Theresa of Savoy, born at Versailles, Jan. 24, 1778. He was educated along with his elder brother the Duke of Angoulême. In 1792 he fled with his father to Turin, served under him and Condé on the Rhine, and early learned the art of winning the love of the soldiers. With his family he repaired to Russia, and in 1801 to England, where he lived alternately in London and Scotland, continually occupied with plans for the restoration of the Bourbons. April 13, 1814, he landed at Cherbourg, and passed through the cities of Bayeux, Caen, Rouen, &c., gaining over the

soldiers and National Guards to the cause of the Bourbons, distributing arms, and delivering prisoners. He made his entrance into Paris, April 21, where he gained popularity by visiting the merchants, manufacturers, and artists. May 15 he was appointed colonel-general, receiving a civil list of 1,500,000 francs. August 1 he set out on a visit to the department of the North, and the fortified places in Lorraine, Franche-Comté, and Alsace. When Napoleon landed from Elba, the king committed to Berri the chief command of all the troops in and round Paris. All his efforts to secure their fidelity proving ineffectual, he was obliged to retreat on the night of March 19, with the troops of the household to Ghent and Alost, where the king then was. The battle of Waterloo enabled him to return to Paris, where he arrived July 8, and surrendered his command over the troops of the household into the hands of the king. In August he was made president of the electoral college of the department of the North. At the opening of the chambers in Paris he took the oath to maintain the constitution, and was appointed president of the fourth bureau; but he soon retired from public life. He died Feb. 14, 1820, of a blow inflicted the previous evening by a political fanatic named Louvel (see LOUVEL). The duke left by his wife Carolina Ferdinanda Louisa, eldest daughter of King Francis I., ruler of the Two Sicilies, whom he married June 17, 1816, only a daughter, Louise Marie Thérèse, afterwards Duchess of Parma; but his widow was afterwards delivered of a prince, subsequently known as Count de Chambord.

BERRUGUETE, ALONZO, a Spanish painter, architect, and statuary, born at Paredez de Nava, near Valladolid, in Spain; went in early life to Italy, studied in the school of Michael Angelo, and became intimate with Andrea del Sarto, Baccio Bandinelli, and other celebrated artists. On his return he was appointed painter to Charles V., and died at Toledo in 1561. His principal architectural works are the new palace at Granada, and the townhouse of Seville; his skill as a statuary is seen to great advantage in the choir of the cathedral of Toledo, and the tomb of the vice-chancellor of Aragon at Saragossa. His best paintings are at Valladolid, Toledo, and Salamanca.

BERSEKER, a descendant of the eight-handed Starkader and the beautiful Alfhilde, was, according to the Scandinavian mythology, a famous warrior. He disdained the protection of armour, whence he received his name, which signifies, according to Ibsen, *armourless*. He raged like a madman in battle. He killed King Swafurum, and married his daughter, by whom he had twelve sons as untamable as himself. They were also called *Berserker*, and after their time the name was given to wild and fierce Scandinavian warriors.

BERTHIER, ALEXANDER, Prince of Neuchâtel and Wagram, marshal, vice-constable of France, &c.; born at Versailles 20th Nov. 1753; son of a distinguished officer; was, while yet young, employed in the general staff, served in America, and fought with Lafayette for the liberty of the United States. In the first years of the French revolution he was appointed major-general in the National Guard of Versailles, and conducted himself in this post with uniform moderation. Dec. 28, 1791, he was appointed chief of the general staff in the army of Marshal Luckner, marched against La Vendée in 1793, joined the army of Italy in 1795, and as general of division and chief of the general staff contributed much to the success of the campaign. In October, 1797, General Bonaparte sent him to Paris to deliver to the Directory the treaty of Campo-Formio. In Jan. 1798, he received the chief com-

mand of the army of Italy, and was ordered by the Directory to march against the dominions of the pope. In the beginning of February he made his entrance into Rome, abolished the Papal government, and established a consular one. Being much attached to General Bonaparte, he followed him to Egypt as chief of the general staff. After the 18th of Brumaire, Bonaparte appointed him minister of war. He afterwards became general-in-chief of the army of reserve, accompanied Bonaparte to Italy in 1800, and contributed to the passage of St. Bernard and the victory at Marengo. He signed the armistice of Alessandria, formed the provisional government of Piedmont, and went on an extraordinary mission to Spain. He then received again the department of war, which, in the meantime, had been in the hands of Carnot. He accompanied Napoleon to Milan, June, 1805, to be present at his coronation, and in October was appointed chief of the general staff of the grand army in Germany. October 19 he signed the capitulation of Ulm with Mack, and Dec. 6 the armistice of Austerlitz. Having in 1806 accompanied the emperor in his campaign against Prussia, he signed the armistice of Tilsit, June, 1807. He afterwards resigned his post as minister of war, and having been appointed vice-constable of France, married, in 1808, Maria Elizabeth Amelia, daughter of Duke William of Bavaria-Birkenfeld, and continued to be the companion of Napoleon in all his expeditions. In the campaign against Austria in 1809, he distinguished himself at Wagram, and received the title of *Prince of Wagram*. In 1810, as proxy of Napoleon, he received the hand of Maria Louisa, daughter of the Emperor Francis I., and accompanied her to France. Somewhat later Napoleon made him colonel-general of the Swiss troops. In 1812 he was with the army in Russia, as chief of the general staff, which post he also held in 1813. After Napoleon's abdication he lost his principality of Neufchatel, but retained his other honours, and possessed the favour and confidence of Louis XVIII., whom, after Napoleon's return, he accompanied to the Netherlands, whence he repaired to his family at Bamberg, where he arrived May 30. After his arrival at this place, he was observed to be sunk in a profound melancholy; and when, on the afternoon of June 1, the music of the Russian troops, on their march to the French borders, was heard at the gates of the city, he put an end to his life by throwing himself from a window of the third story of his palace. (See *Memoires d'Alexandre Berthier*, Pr. de Neufchatel et de Wagram, Paris, 1826.) He left a son, Alexander (born in 1810), one of the most zealous adherents of Napoleon III., and two daughters.

BERTHOLLET. CLAUDE LOUIS, COUNT, member of the scientific academies at Paris, London, Turin, Haarlem, &c.; one of the most eminent theoretical chemists of his times; born at Talloire, in Savoy, Dec. 9, 1748; studied medicine at Turin; went in 1772 to Paris, where he became connected with Lavoisier, was admitted in 1780 a member of the Academy of Sciences in that city; was made in 1794 professor in the normal school there, and was sent to Italy in 1796, in order to select the plunder that was to be carried to Paris. He followed Bonaparte to Egypt, and returned with him in 1799. After the 18th of Brumaire he was made a member of the *senat-conservateur*; afterwards count and grand-officer of the Legion of Honour. In 1804 Napoleon appointed him senator for the district of Montpellier. In 1818 he received the grand cross of the order of the Reunion. April 1, 1814, however, he voted for the establishment of a provisional government and the dethronement of Napoleon. Louis XVIII.

made him a peer; but Napoleon passed him by in 1815. After the restoration of Louis, he took his seat again in the chamber of peers. Among the inventions and new processes with which the sciences and the arts were enriched by him, the most important are those for the charring of vessels to preserve water in ships, for the stiffening and glazing of linen, for the artificial production of nitre, &c., but principally that for the bleaching of vegetable substances by means of chlorine, which, since 1786, has been in general use in France. Besides different essays in the collections of the Academy and the Institute, he has written several larger works, among which his *Essai de Statique Chimique* (1803, two vols.; translated into English, German, and Italian) must be considered as the most important. The complicated phenomena of chemistry were here treated as under the strict and simple laws of mechanics. He had also a large share in the reformation of the chemical nomenclature, as well as in the publication of the work that appeared on this subject in Paris, 1787—*Méthode de Nomenclature Chimique*. He died in Paris, November 7, 1822.

BERTHOLLETTA, the name given in honour of the celebrated philosopher Berthollet to a remarkable genus of trees of the natural order *Lecythidaceae*, of which only one species, the *B. excelso*, is known. This tree forms vast forests on the banks of the Orinoco, averaging 100 feet in height, with a stem only 2 feet in diameter, and destitute of branches till near the top, which becomes bushy and hangs gracefully, producing the well-known Brazil nuts of commerce. The nuts or seeds are contained in a large, round, and very strong seed-vessel, to the number of from fifteen to fifty or more. The nuts contain a great deal of oil. Considerable quantities are exported from Para to the United States and England.

BERTHOUD, FERDINAND, celebrated for his marine chronometers, born at Plancemont, in the county of Neufchatel, in 1727, was destined for the church, but at the age of sixteen conceived an irresistible inclination for mechanics. His father caused him to be instructed in the art of watchmaking, and, to afford him an opportunity of perfecting his knowledge, sent him to Paris. He resided in this city from 1745, and there made his first marine chronometers, which have been used by French navigators on so many occasions for extending and correcting geographical knowledge. He left several works relating to his art. He died in 1807. His nephew, LOUIS BERTHOUD, his pupil and the heir of his talents, extended his improvements still further. His chronometers came to be very widely used by French navigators, and were even more convenient than those of his uncle.

BERVIC, CHARLES CLEMENT, one of the most distinguished engravers of the French school, was born at Paris in 1756, studied his art under George Wille, and may be considered his most eminent pupil. The works of Bervic are among the best of the French school, but are not numerous. The most celebrated of them is the full-length figure of Louis XVI. after a picture of Callot. The copies are very rare and dear, because the plate was broken to pieces in the revolutionary tumults of 1793. The exactness of his drawing, the firmness and brilliancy of his touch, the purity and correctness of his design, and the happiness with which he transferred to his plate the beauties of the original, gave a high character to his productions. He died in 1822.

BERWICK, JAMES FITZ-JAMES, DUKE OF, commanded the armies of England, France, and Spain, was a peer of England and France, as well as a grandee of Spain, and was knighted by the sovereign

of each of these countries. He was the natural son of the Duke of York, afterwards King James II., and Arabella Churchill, sister of the Duke of Marlborough; was born at Moulins in the Bourbonnaise, in 1670, and first went by the name of Fitz-James. He received his education in France, and served his first campaigns in Hungary under Charles, Duke of Lorraine, general of Leopold I. He returned to England at the age of seventeen, and received from his father the title of duke. On the landing of the Prince of Orange in 1688 he went to France with his father, whom he afterwards accompanied on the Irish expedition, fighting bravely, and being wounded at the battle of the Boyne (July 1, 1690). He afterwards served under Luxembourg in Flanders; in 1702 and 1703 under the Duke of Burgundy; then under Marshal Villeroi, and was naturalized in France. In 1706 he was made marshal of France, and was sent to Spain, where he gained the battle of Almanza, which rendered King Philip V. again master of Valencia. In 1709 he went to take the command in Dauphiné, and the measures which he took to cover this and the neighbouring provinces against the superior forces of the Duke of Savoy gained him a great reputation. In 1718 and 1719 he was obliged to serve against Philip V., who from gratitude to the marshal had taken a son of his into his service. On his entrance into the Spanish dominions he wrote to his son, the Duke of Liria, admonishing him to do his duty to his sovereign. At the siege of Philipburg, on the Rhine, in 1734, his life was terminated by a cannon-ball. His memoirs were published originally in French, and have gone through two or three editions in English.

BERWICK, NORTH, a royal borough, watering-place, and sea-port in Haddingtonshire. It is built on a sandy plain, and consists chiefly of two streets, which are straight and tolerably well built. It is a very ancient burgh, but its charter having been lost, it obtained another from James VI. The harbour is small but of easy access. Being situated near the entrance of the Firth of Forth, North Berwick had formerly a considerable trade, but it now employs only a few fishing smacks and vessels for the exportation of grain. It is a favourite resort for sea-bathing and golf. The ancient castle of Tantallon, formerly one of the strongholds of the Douglas family, stands about 3 miles east of the town, surrounded on three sides by the sea, and on the west by a deep fosse with a drawbridge. It was destroyed by the Covenanters in 1699. The existing ruins are much admired. Pop. in 1891, 1998; in 1901, 2784.

BERWICKSHIRE, a maritime county of Scotland, bounded on the E. by the German Ocean; on the N. by East Lothian; on the W. by the counties of Roxburgh, Peebles, and Mid Lothian; and on the S. by the river Tweed and the English borders. It is nominally divided into the three districts of Lauderdale, Lammermoor, and the Merse or March; the first of which divisions is the opening or valley in the Lammermoor Hills, through which flows the river Leader. Lammermoor comprehends the ridge of hills which divides the county from East Lothian, and the Merse or March includes the fertile and populous plain extending from the same hills along the banks of the Tweed. The latter district is remarkable for the fertility of the soil and the excellent system of cultivation, for which the whole county is also celebrated. The total area of the county is 293,948 acres, of which more than 190,000 acres are under crops, bare fallow, and grass, the latter partly consisting of permanent pasture, besides some 67,000 acres of mountain and heath land used for pastoral purposes. The principal rivers of the county are the Tweed, the Leader, the Ely, the Whiteadder, and the Black-

adder; and all except the last contain salmon, of which great quantities are shipped from Berwick for London. There are no lakes worth speaking of, though bogs or marshes of considerable extent are not uncommon. The minerals hitherto discovered in this county are few, and by no means valuable. They consist chiefly of copper, coal, and ironstone, but of each very sparingly. There is, however, plenty of freestone, and also of marl, to which agriculturists in this quarter prefer limestone, though brought from a considerable distance. Vast quantities of agricultural produce are shipped from the ports of Berwick and Eyemouth, and much is also sent to Edinburgh, Dalkeith, Haddington, and Dunbar. Very few manufactures are established in this county, the principal one which it supplies beyond domestic consumption being that of paper. The North Sea fisheries are of great importance. Berwick formerly abounded in strong castles and fortified places, traces of which are to be found everywhere. It returns one member to Parliament; the county town is Greenlaw. Other small towns are Duns and Eyemouth. Pop. in 1881, 35,383; in 1891, 32,398; in 1901, 30,816.

BERWICK-UPON-TWEED, a municipal borough and sea port of England, once forming a county of itself, but now incorporated in Northumberland, on the north or Scottish side of the Tweed, within half a mile of its mouth. It is surrounded by walls formed of earth and faced with stone, which are well preserved, and along which is an agreeable promenade. The streets are for the most part narrow, steep, straggling, and irregular, though some of the principal ones are wide and open. There are in all some twelve churches in the town; the principal schools are the Corporation Academy for the education of the children of freemen, and the grammar-school. Among the principal buildings are the town-hall, with a handsome portico and a spire; the Wallace Green U.F. Church; the infantry barracks, the corn-exchange, the new infirmary, free-masons' lodge, &c. The Tweed is crossed at the town by an old bridge of fifteen arches, measuring 1164 feet in length and only 17 in width, and by a magnificent railway viaduct of stone, 687 yards long and 184 feet in extreme height, with twenty-eight semi-circular arches. The chief industries carried on are iron-founding, the manufacture of engines and boilers, agricultural implements, feeding-cake, manures of various kinds, ropes, twine, &c. The annual average tonnage entered and cleared from the port is about 35,000 tons. The chief exports are grain, artificial manures, and herrings. There is a large weekly grain and cattle market. A dock affording accommodation for large vessels was opened in 1876.

In the beginning of the twelfth century, during the reign of Alexander I., Berwick was part of his realm of Scotland, and the capital of the district called Lothian. Soon after this date it became populous and wealthy, was the chief sea-port of Scotland, contained a strong castle, with churches, hospitals, and monastic buildings, and was created one of the four royal burghs of Scotland. In 1216 the town and castle were stormed and taken by King John. During the competition between Baliof and Bruce for the Scottish throne the English Parliament sat in Berwick; and in the hall of the castle Edward I. pronounced judgment in favour of Baliof. Bruce retook the town and castle in 1318; but, after undergoing various sieges and vicissitudes, both were surrendered to Edward IV. in 1482, and have ever since remained in possession of England. Berwick formerly returned two members to Parliament, but it lost its representation, as separate from Northumberland, in 1885, and now gives name to one of the divisions of the county. Pop. in 1891, 13,377; in 1901, 18,437.

BERYL, or **EMERALD**, a well-known species in mineralogy, sometimes massive in its structure, though commonly found crystallised in regular six-sided prisms, often deeply striated longitudinally, and terminated at one or both extremities by a rough, imperfect plane, or, more rarely, by a very flat, six-sided pyramid, of which the summit is replaced. Its crystals are of various dimensions, being from half an inch to upwards of a foot in length, and from a quarter of an inch to ten inches in diameter. The larger crystals, however, are inferior to the smaller, in regard to those qualities for which this species is esteemed. The lustre of the beryl is vitreous; its colour green, passing into blue, yellow, and white. The brightest of these colours is emerald green, which, as it is rarely known to pass insensibly into the paler hues, has been made the basis of a distinct species in those specimens in which it occurs under the name of *emerald*. This distinction of species is not considered at present as well-founded; and the beryl and emerald are looked upon as identical by most mineralogists. It is translucent or transparent, and its hardness enables it to scratch quartz. Its specific gravity is from 2.6 to 2.7. It is composed of silica, 68.35; alumina, 17.80; glucina, 13.13; oxide of iron, .72, with a trace of lime and oxide of chromium and tantalic acid.—The beryl is widely diffused. It belongs to the primitive rocks, and is embedded in veins of quartz and feldspar, which traverse granite and mica slate. It is also found in great abundance in a compact ferruginous clay in Daouria, and in fractured crystals and rolled masses in secondary deposits, where it is not supposed to have had its origin. Some of the most remarkable localities of beryl are in Siberia, at Cairngorm in Scotland, at Limoges in France, and in Massachusetts, Maine, and New Hampshire in the United States. The deep-green variety, emerald, so much valued as a gem, comes from Peru and Upper Egypt: a few fine crystals have also been obtained from granite veins at Topham in Maine.

BERZELIUS, **JOHN JAMES**, **BARON**, one of the greatest chemists of modern times, born in 1779, at Westozona, near Linköping, East Gothland, where his father was chaplain, received his first education at home, then attended the Linköping gymnasium, and in 1796 proceeded to the University of Upsal to study medicine. Here, however, his attention was chiefly attracted by the initiatory branches of natural science, and more especially by chemistry. The first-fruit of his studies, and of a year's residence as assistant to a physician at the famous watering-place of Medewi, was the *Nova Analysis Aquarum Medewiensium* (Upsal, 1800). After publishing a tract entitled *De Electricitatis Galvanicæ in Corpora Organica Effectis* (Upsal, 1802), and taking his doctor's degree, he was appointed by the board of health in 1802 adjunct of medicine and pharmacy in Stockholm. With these offices, together with medical practice, he combined a course of public lectures on experimental chemistry and private instruction in pharmacy, till 1806, when he was appointed teacher of chemistry in the military academy. The following year he became professor of medicine and pharmacy in Stockholm. Here, along with other medical practitioners, he instituted the Swedish Medical Society. In 1808 he was admitted a member of the Academy of Sciences at Stockholm, in 1810 one of its directors, and in 1818 its perpetual secretary. This office he continued to hold during the remainder of his life. In 1818 the king, while allowing him to retain his own name, made him a noble; and in 1835, on the occasion of his marriage with a daughter of Poppus, a councillor of state, he was named a baron. As deputy to the National

Assembly and a councillor of state, he did not display much activity, but his services to chemical science have been so numerous and important that it is difficult to bring them briefly under review. The existing state of chemistry is founded in a great measure on his discoveries and views, though, by the rapid development of the science, the edifice which he erected has undergone many alterations, and several defects have been discovered in it. Hence his views in regard to atomic weights, his electro-chemical theory, and his mode of procedure in organic chemistry, have met with many opponents. He discovered selenium and thorium, first exhibited calcium, barium, strontium, tantalum, silicium, and zirconium in the elemental state, and investigated whole classes of compounds, as those of fluoric acid, the metals in the ores of platinum, tantalum, molybdenum, vanadium, sulphur salts, &c. He introduced a new, or at least a wholly altered nomenclature and classification of chemical compounds. In short, there is no branch of chemistry to which he has not rendered essential service; and his labours are so numerous that, when the accuracy with which they have been executed is kept in view, it becomes almost incomprehensible how one man should have been able to perform them. It ought to be especially mentioned that he never rested satisfied with the bare investigation of isolated facts, but always extended his investigations over a wide field, so as to contribute to the advancement of chemistry as a whole. In addition to his numerous communications to the journals and periodicals of the period, may be mentioned, among his separate works, his *View of the Composition of Animal Fluids*, *New System of Mineralogy*, *Essay on the Theory of Chemical Proportions*, and above all his *Text-book of Chemistry*, which has been translated into most European languages. As secretary of the Academy of Sciences, he published an annual account of the progress of chemistry and mineralogy, which, having been continued during twenty-seven years, extends to as many volumes. He died in 1848.

BESANÇON, a fortified town of France, capital of the department Doubs, 208 miles S.E. of Paris. It is agreeably situated at the extremity of a valley watered by the Doubs, which almost surrounds the town, and divides it into two parts. These communicate with each other by a stone bridge, part of which is a Roman structure of large blocks, and part a modern erection, for the purpose of enlarging the roadway. The town is surrounded by hills, covered with vineyards. The isthmus or peninsula on which it is built is composed of a mass of rocks crowned by the citadel, which commands the country towards the north, but the citadel itself is commanded by several eminences in the neighbourhood, on which forts have been erected for the purpose of securing the approaches. Besançon is one of the strongest towns in France, and also one of the best built. The streets are spacious and well laid out, and the squares are adorned with fountains. A splendid promenade is formed within the town on the banks of two branches of the Doubs. Among the public buildings are the cathedral and three other churches (containing some fine pictures and sculptures), the hospital, the prefecture, the college, and the palace of justice. The citadel is one of Vauban's finest works. There are here a theatre, a large and valuable public library, a museum, a botanic garden, school of artillery, lyceum, &c. In the environs are the splendid ruins of the castle of Montfaucon. The trade and manufactures are extensive. The latter comprise linen, cotton, woollen, and silk goods, ironmongery, &c.; but the principal industry is watchmaking. It employs about 13,000 workmen who make as

many as 400,000 watches yearly. There are also extensive foundries, breweries, saw-mills, and tanneries. Besançon is the ancient Vesontio, Besontium or Bisontium, which is mentioned by Cæsar, who drove the Sequani from it in 58 B.C., as a place of great extent and natural strength. In the fifth century it came into the possession of the Burgundians, in the twelfth it passed along with Franche-Comté to the German Empire. It was taken by Louis XIV. in 1668 and 1674, and in 1679, along with the rest of Franche-Comté, it was ceded to France. It remained the capital of Franche-Comté till 1793, and had a parliament, university, &c. Several of the streets and places still bear their old Roman names, and there are numerous Roman remains, especially a triumphal arch of the Emperor Aurelian, an aqueduct, an amphitheatre, and a large theatre. Pop. (1896), 57,556.

BESSARABIA, since the peace of Bucharest, in 1812, between Turkey and Russia, a province in the extreme S.W. of European Russia, stretching in a north-westerly direction from the Black Sea, between the Pruth and the Dniester; area, 17,619 square miles. A portion of it at the S.E. extremity was ceded to Turkey in 1856, but was restored in 1878. Bessarabia is mostly a plain country and is fertile in grain, and also affords excellent pasturage. Agriculture is chiefly developed in the north, pasturage is most largely carried on in the south, in the middle portion of the government are extensive forests. It is watered by the Dniester, the Pruth and the Danube. The inhabitants include Russians, Poles, Roumanians, Bulgarians, Germans, Armenians, Jews, &c. The capital is Kisheneff, a large and important commercial town. The products include salt, wool, tallow, leather, soap, &c. Pop. 1,622,286.

BESSEGES, a town of France, department Gard, on the Cèze, connected by railway with Lyons and other towns. There are here coal-mines, ironworks, blast-furnaces, &c. Pop. (1896), 7289.

BESSEL, FRIEDRICH WILHELM, a celebrated German astronomer, born at Minden in 1784, entered a commercial house at Bremen in his fifteenth year, and there acquired a decided taste for geographical and maritime studies. This led him to turn his attention to astronomy, and he soon found it to be his true vocation. An astronomical tract which he had drawn up brought him into communication with Olbers, who encouraged him in his labours, and procured for him the appointment of inspector of astronomical instruments to the University of Göttingen. In 1810 he removed to Königsberg, and in 1812-13 he superintended the construction of the observatory of this town. From 1824 to 1833 he completed a series of 75,011 observations on the celestial zone contained between 15° N. and 15° S. declination. These observations included all the stars in the zone as far as the ninth degree. A dissertation which he published in 1844 contains important investigations on the variability of the movements of the fixed stars. An important share in the discovery of the new planet Neptune belongs to him, as in a paper read in 1840 he called attention to the existence of a planetary mass beyond Uranus, founding on considerations which were afterwards happily proved to be correct. His health began to give way in 1844, and after a lingering illness he died in 1846. His principal works are an *Essay on the Path Traversed by the Comet of 1807*, *Astronomical Observations during various years*, *Determination of the Length of the Pendulum which Beats Seconds at Berlin*, *Investigations and Measurements made with a view to establish a Metrical Unit for Prussia*, *Measure of the Distance of the Sixty-first Star of the Constellation of the Swan*, and *Popular Lectures on Scientific*

Questions. These last, consisting of papers which Bessel had read before the Physico-economical Society of Königsberg from 1833-1844, were published after his death by his friend Schumacher, in 1848, at Hamburg.

BESSEMER STEEL. See STEEL.

BETANZOS, a town of north-western Spain, province Coruña, on the river Mandeo, which somewhat further north enters the Ria or inlet of Betanzos. Pop. (1897), 8187.

BETEL, is the leaf of a climbing East Indian plant (*Chavica bella*), which belongs to the same tribe as pepper, and in shape and appearance is not much unlike ivy, but is more tender and full of juices. It is insipid to the taste, and generally narcotic. There is an almost incredible consumption of betel throughout India, and other parts of the East. The inhabitants chew it almost incessantly, and in such quantity that their lips become reddish-brown and their teeth black—a colour greatly preferred by them to the whiteness which the Europeans so much affect. They carry it about their persons, and present it to each other, by way of compliment and civility, in the same manner as Europeans do snuff, and this is done by the women as well as by the men. The leaves are sometimes used alone, but much more commonly when covered with a kind of lime made of sea-shell, and wrapped round slices of the areca-nut, the fruit of the areca-palm. This nut receives the name of *betel-nut* because so commonly used along with the betel leaf. See ARECA.

BETHANY, a village of Palestine, at the foot of Mount Olivet, on the E. side, about two miles S. of Jerusalem, where Lazarus dwelt and was raised from the dead, and where the ascension of Christ is related to have taken place. The house and grave of Lazarus, and the house of Mary Magdalene, are still shown to travellers.

BETHESDA, a pool in Jerusalem, the name of which signifies *house of mercy*. In the five halls or porticos near it many patients lay waiting, according to the account of John (ch. v.), for the moving of the waters, to bathe in. According to the belief of the Jews, an angel descended, at a certain time, into the pool and troubled the water, and whoever first entered the water after this agitation was cured. In 1888 a rock-hewn basin or reservoir was discovered, with five chambers adjoining, which is supposed to be identical with the pool of Bethesda.

BETHLEHEM, the birth-place of our Saviour, a village in Palestine, five miles from Jerusalem, at the foot of a hill covered with vines and olive-trees. An aqueduct conveys water from the hill to the village. Its inhabitants are chiefly Christians, and make rosaries, crucifixes, &c., for pilgrims. There are three convents here, for Roman Catholics, Greeks, and Armenians, surrounding a stately church, said to have been erected by the Empress Helena in A.D. 327 over the place where Christ was born. It is built in the form of a cross, and separate portions of it are allotted to the Latins, Greeks, and Armenians respectively. On either side of the nave are two rows of beautiful columns, marking off two corresponding aisles. The top commands a fine view over the surrounding country. In a rich grotto, furnished with silver and crystal lamps, under the choir of this church, a trough of marble is shown, and is said to be the manger in which Jesus was laid after his birth. Several other spots mentioned in the Bible are shown here. Pop. 7000.

BETHLEHEM. There are many places in the United States with this name. One of the most important is a town in Northampton county, Pennsylvania, on the Lehigh, across which are two bridges leading to S. Bethlehem, 48 miles N.N.W.

Philadelphia. Pop. (1890), 6762. It is pleasantly situated, regularly laid out, and was founded in 1741 by Moravians, who have a church, theological seminary, and other institutions here. In South Bethlehem is Lehigh University (Episcopal), occupying a fine building. Pop. (1890), 10,802.

BETHLEM-GABOR, that is, *Gabriel Bethlem*, son of a Calvinistic gentleman in poor circumstances, entered the service of Gabriel Bathori, prince of Transylvania, fought under his orders, and then repaired to Constantinople, where his courage gained him the esteem of the Turks. Prompted by ambition, he became ungrateful to his first benefactor; and after bringing Bathori into bad odour both with the Transylvanians and the Turks, managed to make the latter declare war, and actually headed a Turkish army against him. His treachery was successful, and in 1613 he was proclaimed Prince of Transylvania. Shortly after, having succeeded in stirring up the Hungarians against the Emperor Frederick II., he took several places, and in 1618 assumed the title of King of Hungary. Thereafter, supported by the Turks and Tartars, he entered the Austrian territories, laid waste Moravia, hemmed in the imperial army, and was on the eve of gaining a complete victory when the refusal of the Turks to undergo a winter campaign defeated all his hopes. The approach of Tilly compelled him to withdraw, and he was glad to conclude a peace which deprived him of his Hungarian title, but left him in possession of his conquests. But his restless spirit would not allow him to remain at peace, and he was always engaged either in making war himself, or in stirring up others to engage in it, with a view to his own advantage. While preparing for a new war against the imperialists he was attacked with dropsy, and died in 1629 without leaving any heir to his throne. His warlike temper may be estimated from the fact that he began to carry arms at the age of seventeen, and had fought in forty-two battles.

BETHUNE, a town of France, in the department of Pas de Calais, capital of an arrondissement of the same name, 19 miles N.W. of Arras. It stands on a rock washed by the Drette, and is a place of considerable strength. The appearance of the town is not prepossessing. The houses are ill built and the streets are bad. There is, however, one fine square, the centre of which is occupied by an ancient belfry of remarkable construction, while the hotel-de-ville, among the best edifices in the town, forms one of its sides. The chief manufactures are oil, soap, and cloth. There are also distilleries, tanneries, and salt and sugar refineries. The trade is greatly favoured by the canals of Lawe and Basée, which meet here and form a fine basin. The family of the lords of Bethune is very celebrated, and a branch of it was established in Scotland about the end of the twelfth century. To this branch the persecutor Cardinal Beaton belonged. Pop. (1896), 10,529.

BETLIS, **BEDLIS**, **BIDLIS**, **BYLIS**, or **BITTIS**, a town, Turkish Armenia, about 20 miles W. from Lake Van. It is one of the most ancient cities of Kurdistan, situated in a wide ravine, traversed by a stream, on whose steep banks the town is built. The houses are of red stone, generally two stories in height, with grated windows to the streets. In the centre of the town, on a high rock, is an ancient castle, formerly the residence of the khans of Betlis. The town contains several caravansaries, a number of mosques, nine churches, and three baths. The country around is fertile, well cultivated, and produces excellent crops of grain, cotton, hemp, rice, olives, tobacco of the best description, and a variety of fruits and vegetables of superior quality. The principal manufactures of the town are of coarse

cotton cloth and tobacco, the greater part of the latter being sent to Erzeroom and Constantinople. The inhabitants consist of Turks, Kurds, and Armenians. Pop. from 15,000 to 30,000.

BETROTHMENT, a mutual promise or compact between two parties, by which they bind themselves to marry. The word imports giving one's troth, that is, true faith or promise. Formal ceremonies of betrothment are not the custom in Great Britain, as they are on the Continent, where betrothment is either solemn (made in the face of the church), or private (made before witnesses out of the church). As betrothments are contracts, they are subject to the same rules as other contracts; for instance, that they are valid only between persons whose capacity is recognized by law; and the use of fraud, violence, or intimidation vitiates the contract. The consent of both parties, of course, is required. This may be expressed either verbally, or by writing, or by action. In Germany, the consent of the parents is always necessary, if the parties are under age, not yet *sui juris*. But if the parents withhold their consent unreasonably, the permission of the judge is allowed to sanction the contract. If the opinions of the parents are diverse, the law gives effect to that of the father. Betrothments contracted thus, according to law, are called *sponsalia publica*; others are called *sponsalia clandestina*. The latter are, in some places, utterly invalid; in others, only punishable. By the common German law, however, they are valid in every case in which consummation or consecration by the priest has taken place. The parents, in these cases, are not allowed to apply for a dissolution of the contract, nor can they refuse their consent, except for highly important reasons. Public betrothment induces the obligation to marry. In case of refusal to complete the contract by marriage, the injured party is allowed an action at law to compel its performance; but, since unhappy marriages are among the greatest misfortunes, the means of compulsion applied by the law are never great, amounting only to a small fine, or a short imprisonment. If circumstances take place which, if happening before the betrothment, would have necessarily prevented it, the party affected by them is allowed to recede from the engagement, and the modern laws allow only an action for damages. In Germany, betrothment generally takes place in a small company of relations and friends. In Russia, it was once binding and indissoluble, like marriage, but is now a mere form accompanying the marriage ceremony.

BETTERTON, **THOMAS**, a celebrated actor in the reign of Charles II., was born in Westminster in 1635, and excelled in Shakespeare's characters of Hamlet, Othello, Brutus, and Hotspur. In 1693 he opened a new play-house in Lincoln's-Inn-fields, but did not succeed. He died in 1710, and was buried in Westminster Abbey. He wrote the *Woman made a Justice*, a comedy; the *Amorous Widow*, or the *Wanton Wife*; *Diocletian*, a dramatic opera, &c. The *Unjust Judge*, or *Appius and Virginia*, a tragedy, was written originally by Mr. John Webster, and altered by Betterton.

BETTINELLI, **SAVERIO**, an Italian author, born at Mantua in 1718, studied there and at Bologna under the Jesuits; entered, in 1736, the novitiate of this order, and taught, from 1739 to 1744, belles-lettres at Brescia, where he made himself known by some poems composed for the use of schools. In Bologna, where he studied theology, he continued to cultivate his poetical talents, and wrote for the theatre of the college his tragedy of *Jonathan*. In 1751, he was intrusted with the direction of the college of nobles at Parma. After having remained there some years, he travelled in France and Ger-

many, and returned to Italy in 1759. He now resided for a considerable time at Verona. After the suppression of the Jesuits in 1773 he returned to his native city, where he resumed his literary labours with renewed zeal. He preserved the cheerfulness and serenity of his spirit to the age of ninety years; and died in 1808, with the composure of a philosopher and the devotion of a Christian. His chief work is his *Risorgimento negli Studj, nelle Arti e ne' Costumi dopo il Mille* (Bassano, 1775, 2 vols.), a superficial work, which is, however, not destitute of new and just views. The *Lettere dieci di Virgilio agli Aroadi* attracted great attention, and his attempted depreciation of the older poets, particularly Dante, involved him in many contests. The best of his poems are his *Versi Scolti*, which, though they do not show any great poetical power, are always elegant and ingenious.

BEUTHEN, a town of Prussia, in the province of Silesia, in the government of Oppeln, about 2½ miles from the Polish frontier. It has steam and electric tramways, and among buildings of note are the R. Catholic church of St. Mary (thirteenth century), Protestant parish church (fifteenth century), synagogue, royal Catholic gymnasium, higher girls' schools, &c. It is an important centre of mining and metallurgy, having ironworks, zincworks, lead-works, coal-mines, and various industrial establishments. Pop. (1895), 42,848, the great majority being Catholics.

BEVERIDGE, WILLIAM, a learned divine, born at Barrow, Leicestershire, in 1637, studied at St. John's College, Cambridge, devoting his attention particularly to oriental literature, in which he made so much proficiency that in 1658 he published a work on the excellence and use of the eastern tongues, especially the Hebrew, Chaldeæ, Syriac, Arabic, and Samaritan, accompanied with a Syriac grammar. In 1660 he took orders, and obtained the vicarage of Ealing in Middlesex, where he wrote a useful introduction to chronology. In 1672 he was appointed to the rectory of St. Peter, Cornhill, London, and the same year published his *Synodicon* in 2 vols. folio, containing the Apostolic Canons, decrees of the Councils received by the Greek Church, and the Canonical Epistles of the Early Fathers. This work called forth an opponent, to whom Beveridge replied in a *Vindication*. In 1674 he obtained a prebend in St. Paul's, and in 1681 was appointed archdeacon of Colchester. In 1684 he became prebendary of Canterbury, and in 1688 was appointed chaplain to William and Mary. Shortly after the see of Bath and Wells was offered to him; but as it had become vacant by the conscientious refusal of the excellent Bishop Ken to take the new oaths, Beveridge, to his honour, declined to accept of it. The episcopal honour, however, was only delayed; in 1704 he became Bishop of St. Asaph, and immediately addressed a pastoral letter to his clergy, enforcing the duty of catechizing, and at the same time furnished them with a model, by printing a tract entitled *The Church Catechism Explained*. He died at Westminster in 1708. Among his best-known works are *Private Thoughts upon a Christian Life*, and the *Great Necessity and Advantage of Public Prayer and Frequent Communion*. Collective editions of his works were published in 1824 and in 1842-46.

BEVERLEY, a municipal borough of England, capital of the M. riding of Yorkshire, 29 miles S.E. from York and a mile from the river Hull. It stands on the N. edge of the Yorkshire wolds, and on a branch of the North-Eastern Railway, and consists of a principal street above a mile in length, and several minor streets, all spacious and tolerably well

built. Its most remarkable edifice is the minster, in the decorated and perpendicular English styles, and one of the finest specimens of ecclesiastical architecture in the kingdom. Other churches are St. Mary's and St. Nicholas's. Among the other chief buildings are the Guildhall and Corn Exchange. The chief manufactures are leather, iron castings, agricultural implements, whiting, linned oil and cake, manures, wagons, cement, and beer. Its environs abound with beautiful walks. It sent two members to Parliament till disfranchised in 1870. Pop. in 1891, 12,539; in 1901, 13,185.

BEVERLEY, SAINT JOHN OF, Bishop of York, was born of a noble family about the middle of the seventh century at Harpham in Yorkshire, educated at Canterbury under Archbishop Theodore, and became a monk under Hilda in the monastery founded by her at Whitby. In 687 he was appointed to the see of Hexham, and in 706 he became Bishop of York. He was very learned for his age. He founded a convent of nuns at Beverley, and built the choir of the church there. He resigned his bishopric and retired to Beverley in 718, dying there in 721. Bede, who is said to have been his pupil, speaks of him with great veneration, and in common with others believed that he had the power of working miracles. He was canonized in 1037, and his remains were dug up and placed in a costly shrine, being finally interred in Beverley minster. His fame was so wide-spread that when William the Conqueror led his army to the north and ravaged the country, he saved the town of Beverley, from respect to the memory of the bishop. In 1416 Archbishop Chicheley ordered the anniversary of his death to be celebrated as one of the festivals of the church, and special privileges were conferred on his church at Beverley by several English sovereigns. He is said to have written an Exposition of Luke and Homilies on the Gospels.

BEWDLEY, a municipal and former par. borough of England, in Worcestershire, 14 miles N.W. of the city of Worcester, beautifully situated on the right bank of the Severn, here crossed by an elegant stone bridge. The town-hall is a neat structure of stone; the market-place has piazzas round the sides for stalls. Among places of worship may be mentioned the church of St. Anne, partly in the classic style. The manufactures include combs, ropes, bricks, powder-flasks, &c., tanning and malting. Pop. in 1891, 2876; in 1901, 2866.

BEWICK, THOMAS, a celebrated wood-engraver, who may be said to have resuscitated the art, was born at Cherryburn, in the parish of Ovingham, Northumberland, on the 12th of August, 1753. He early showed a great talent for drawing, and was apprenticed to an engraver in Newcastle. The celebrated Dr. Hutton of Woolwich, then a schoolmaster in Newcastle, was preparing his great work on mensuration, and having employed Bewick's master in getting up the woodcuts for illustrating it, the execution of these was intrusted to the young apprentice. Bewick performed the work so admirably that his master advised him to turn his attention to wood-engraving, and accordingly with this view he proceeded to London. He returned, however, to Newcastle after a short time, and established himself there in partnership with his master. His turn of mind led him to the study of natural objects, more especially animals; and in 1790 appeared his *History of Quadrupeds*, the beauty of the illustrations of which attracted universal attention, so superior were they to anything hitherto produced by the art of wood-engraving. In 1797 appeared the first, and in 1804 the second volume of his *British Birds*, generally regarded as the finest of his works. Bewick has

never been surpassed in his spirited delineations of animals, and the admirable naturalness with which the accessories and backgrounds of the drawings, such as foliage, grass, and other rural objects, are represented. The *tail-pieces*, or appendages to chapters throughout his works, are of the highest excellence, and display often a rich vein of humour. His illustrated edition of *Æsop's Fables* appeared in 1818. Bewick died at his residence near the Windmill Hills, Gateshead, on the 8th November, 1828. His younger brother John was his apprentice, and gave promise of attaining equal eminence with his brother as a wood-engraver. He was cut off by consumption on the 5th December, 1795, at the untimely age of thirty-five.

BEY, among the Turks, signifies a *governor* of a town, sea-port, or small district. The Turks write the word *beg* (which see). See also BEGLERBEG.

BEYROUT, or BEIRUT (ancient *Berytus*), a sea-port of Syria, 60 miles N.W. of Damascus, with about 120,000 inhabitants in 1894, 70,000 of whom are Christians. In trade and commerce it holds the chief place in Syria. It stands on a tongue of land projecting into an open bay, and spreading out towards the land into a beautiful plain, backed by the mountains of Lebanon. It consists of the old town, composed generally of narrow dirty streets, the residence of the poorer classes, and the business place of the merchants; and of the new town, which stretches around it. The latter, with its modern houses, carriage roads, and gardens—its churches, colleges, schools, and hotels—has little or nothing of the oriental in its composition. Beyrout has rapidly increased since 1835, when its population was only 12,000, its rise being largely due to the extension of the silk trade, of which it is the centre. The better protection afforded both to foreigners and natives by its being the residence of the consuls-general has also contributed to its prosperity. Besides silk its principal exports are olive oil, cereals, sesame seed, tobacco, and wool. In ancient times Beyrout was a large and important Phœnician city, and under the Romans was long celebrated for its school of jurisprudence. The Byzantine emperor Theodosius II. raised it to the rank of a metropolis. After being destroyed by an earthquake in 551, it again rose to a considerable town in the time of the Crusades. In later times it was long in the possession of the Druses. It was bombarded and taken by the British on the 29th of August, 1840. There is a railway to Damascus.

BEZA (properly *de Bèze*), THEODORE, next to Calvin, the most distinguished for genius and influence among the preachers of the Calvinistic church in the sixteenth century. Born of a noble family at Vezelay, in Burgundy, June 24, 1519; educated in Orleans under Melchior Volmar, a German philologist devoted to the Reformation; and early familiar with the ancient classical literature, he became known at the age of twenty years as a Latin poet, by his petulant and witty *Juvenilia* (a collection of poems of which he was afterwards ashamed). In 1539 he was made a licentiate of law, and in the same year invited by his family to Paris. He received from his uncle the reversion of his valuable abbey Froimond, and lived on the income of two benefices and the property which he had inherited from a brother. His habits at this time were dissipated. His handsome figure, his talents, and his connection with the most distinguished families opened to him the most splendid prospects. But a clandestine marriage in 1543 recalled him from his excesses, and a dangerous illness confirmed the intention which he had formed at Orleans of devoting himself to the service of the Reformed Church; so that, after his recovery, he forsook all the advantages of his situation in Paris, and

repaired with his wife to Geneva in 1547. Soon after he accepted a professorship of the Greek language at Lausanne. During the ten years of his continuance in this office he wrote a tragi-comic drama in French—the *Sacrifice of Abraham*—which was received with much approbation; delivered lectures (which were numerous attended) on the Epistle to the Romans and the Epistles of Peter (which served as the basis of his Latin translation of the New Testament, of which he afterwards published several editions, always with improvements); finished Marot's translation of the Psalms in French verse; and obtained to such a degree the confidence of the Swiss Calvinists that he was sent in 1558 on an embassy to the Protestant princes of Germany to obtain their intercession at the French court for the release of the Huguenots imprisoned in Paris. In the following year he went to Geneva as a preacher, and soon after became a professor of theology, and the most active assistant of Calvin, to whom he had already recommended himself by several works, in which many of the views of that eminent theologian were advocated with great zeal, and no small measure of ability, so that he was generally regarded as Calvin's ablest coadjutor, and the person destined to be his successor. His talents for negotiation were now often put in requisition by the Calvinists. He was sent to the court of Anthony, king of Navarre, at Nerac, to obtain the toleration of the French Huguenots; and at his desire he appeared, 1561, at the religious conference at Poissy, where he spoke in behalf of his party with a boldness, presence of mind, and energy which gained him the esteem of the French court. He often preached in Paris before the Queen of Navarre and the Prince of Condé; also in the suburbs. At the conference of St. Germain, in 1562, he spoke strongly against the worship of images, and after the commencement of the civil war accompanied the Prince of Condé as chaplain, and on the capture of the prince joined the Admiral Coligny. After the restoration of peace he returned to Geneva in 1563, where, besides discharging the duties of his office, he continued to engage in theological controversies in support of the Calvinists; and after Calvin's death in 1564 became his successor, and was considered the first theologian of this church. He presided in the synods of the French Calvinists at La Rochelle (1571) and at Nîmes (1572), where he opposed Morel's proposal for the alteration of clerical discipline; was sent by Condé (1574) to the court of the elector palatine; and at the religious conference at Montpellier (1586) opposed the theologians of Wurtemberg, particularly James Andreas. At the age of sixty-nine years he married his second wife (1588), and still continued to repel, with the power of truth and wit, the attacks and calumnies which his enemies, apostatized Calvinists (such as Bolsec), Lutherans, and especially the Jesuits, heaped upon him. They reported in 1597 that he had died, and returned before his death to the Catholic faith. Beza, now seventy-eight years old, met his assailants in a poem full of youthful enthusiasm, and resisted in the same year the attempts of St. Francis de Sales to convert him, and the alluring offers of the pope. In 1600 he visited Henry IV. in the territory of Geneva, who presented him with 500 ducats. After having enjoyed excellent health during almost his whole life, he died Oct. 13, 1605, of old age. By a rigorous adherence to the principles of Calvin, in whose spirit he presided over the church of Geneva, he had become the chief of his party, and enjoyed for forty years the reputation of a patriarch, without whose approbation no important step was taken. In order to preserve the unity and permanency of his church, he readily sacrificed his own peculiar

views on minor matters, and rendered the most important services by his various erudition, his constant zeal, his active spirit, and his brilliant eloquence. Among his many works, his exegetic writings, and the able and correct History of Calvinism in France from 1521 to 1563, which is ascribed to him, are still much esteemed.

BEZANTS, round, flat pieces of pure gold, without any impression, supposed to have been at one time the current coin of Byzantium. Bezants are frequently employed as one of the charges in heraldry, a custom supposed to have been introduced by the Crusaders.

BÉZIERS, a town in the south of France, in the department of Hérault, 88 miles south-west of Montpellier. It is beautifully situated on a height above the Orb, and on the Canal du Midi, a few miles from the Mediterranean, to which there runs a tramway line. It presents a very picturesque appearance, is surrounded by old walls, and though its streets are narrow, it is tolerably well built. Its most conspicuous edifice is the cathedral, a Gothic structure, crowning the height on which the town stands, and possessing a fine semicircular choir surrounded by columns of red marble. Its manufactures consist chiefly of woollens, silks, hosiery, chemicals, spirits, &c. In 1209 Béziers was the scene of a horrible massacre of the Albigenes. The abbot of Cîteaux, who with the bishop of the district headed the murderers, apologizes in a letter to Pope Innocent III. for not having slain more than 20,000. Pop (1896), 48,012.

BEZOAR, a concretion or calculus, of an orbicular or oval form, met with in the intestines of certain animals of the ruminant order. Nine varieties of bezears have been enumerated. They differ greatly in composition, but they may be divided into those which consist mainly of mineral and those which consist of organic matter. The true oriental bezears, obtained from the gazelle, belong to the second class. When broken they have a waxy appearance, they are devoid of odour and taste, and burn away, leaving little ash. There are two kinds; one, consisting of ellagic acid, has a specific gravity 1.1; the other, of lithofellic acid, has a specific gravity 1.6, and is greener in colour. They were formerly celebrated for their supposed medicinal virtues, and distinguished by the name of the countries from which they came, or the animals in which they were found. They were considered as protective against infection and as antidotes to poison. Besides being taken internally, they were worn around the neck as amulets. It is almost needless to add that the accounts of their extraordinary virtues are now considered as totally fabulous.

BHAGAVAD-GĪTĀ (that is, in Sanskrit, *the Divine Song*), the title of a religious-philosophical didactic poem interwoven as an episode in the great Indian epic of the Mahābhārata. See **SANSKRIT**.

BHARTRIHARI, an Indian poet, author of a book of apothegms. According to the legend he was the brother of King Vikramāditya, who lived in the first century B.C. The collection of 300 apothegms (short poems) bearing his name present us with graceful descriptions of nature, charming pictures of love, shrewd remarks on everyday life, and profound thoughts on the deity and the immortality of the soul. Bhartihari was the first Indian writer who became known in Europe, 200 of the apothegms having been translated by the missionary Abraham Roger and published at Nürnberg in 1653.

BHAUGULPORE, or **BHAGALPUR**, a city of Hindustan, in Bengal, capital of a district and division of the same name, beautifully situated on the right bank of the Ganges, 113 miles N.W. of Moorshedabad.

In the town and neighbourhood are some interesting Mahomedan shrines; and there are here also two monuments, one erected (in 1780) by natives, and the other erected by government in memory of Augustus Cleveland, the conciliator of the formerly turbulent and marauding hill tribes of Sonthals. There are several indigo works in the neighbourhood. Pop. (1901), 75,273.—The division of Bhagulpore lies between that of Rajshahi on the east and that of Patna on the west. It has an area of 20,511 square miles, and a pop. (chiefly Hindus and Mohammedans) of 8,066,111.—The district of Bhagulpore is fertile, well watered, and highly cultivated. It is divided into two unequal portions by the Ganges. Area, 4268 square miles; pop. 1,967,655.

BHILSA, or **BILSA**, a town of Hindustan, in Scindia's Dominions (Gwalior), on a trap rock on the right bank of the Betwa, 280 miles S.W. Allahabad. It has a fort inclosed by a ditch and a stone wall surmounted by square towers, and is a place of Hindu pilgrimage. One of the curiosities of the place is a brass gun measuring 19½ feet in length, with a bore of 10 inches; elegantly proportioned, highly ornamented, and said to have been made by order of the Mogul emperor Jehangir. Fine tobacco is produced in the vicinity. In the neighbourhood are some very large and remarkable ancient Buddhist monuments known as *stupas*, one of the principal being a dome-shaped structure 70 or 80 feet in height. Pop (1891), 9700.

BHOLAN PASS. See **BOLAN PASS**.

BHOPAL.—1. A native state of Central India, under British protection, bounded N., W., and S. by Scindia's Dominions. The Nerbudda forms a natural boundary through nearly the whole extent of the S. frontier; length, E. to W., 140 miles; breadth, N. to S., 81 miles; area, 6874 square miles. The country is full of jungles, and is traversed by a hilly tract, forming part of the Vindhya Mountains. The soil is fertile, yielding wheat, maize, millet, peas, and other vegetable productions peculiar to Central India. Sugar, tobacco, ginger, and cotton are the chief exports. The district is well watered by the Nerbudda, Betwa, and other minor streams. The state of Bhopal was founded by an Afghan adventurer, named Dost Mohammed Khan, who in 1723 succeeded in establishing himself here by the countenance of Aurungzebe, on whose death he assumed the title of nabob, which was retained by his successors. Bhopal has all along been friendly in its relations with the British. In 1818 the state was placed under British protection. Pop. in 1891, 1,904,800.

—2. A town, capital of the above state, on the boundary between Malwah and Gundwana, 108 miles E. of Oojein. It was defended successfully in 1813 against the forces of Scindia and the Rajah of Nagpore. It is surrounded by a wall and contains a fort. Outside is another fort on a large rock, the residence of the ruler of Bhopal. Large artificial lakes supply good water. Pop. (1891), 70,338.

BHUTPORE, or **BHARTPUR**.—1. A native state of India, bounded E. by Agra, S. and W. by the Rajpoot States; area, 1974 square miles. The surface is generally low and the state is scantily supplied with water; soil generally light and sandy; chief productions, corn, cotton, sugar, and salt. It has been under British protection since 1826. Pop. (1891), 640,620.—2. A town, the capital of the above state, on an extensive and fertile plain, 110 miles S.W. of Delhi. It covers an area about 4 miles in circuit, and was so strongly fortified that in 1805 it stood a siege by Lord Lake of fourteen weeks, and cost the besiegers 3100 men. In a second siege, in 1826, its resistance to Lord Combermere was less successful. The fortifications have been demolished, but the fort still

exists, and is inclosed by a wet ditch and a wall of hewn stone, which taken together are 60 feet high. Within the fort is the rajah's palace, built of red and yellow freestone in the Mogul style, and picturesquely crowning an eminence surrounded by flower-gardens and fountains. Pop. in 1891, 67,560.

BHUTAN. See **BODAN.**

BIALYSTOK, or **BIELOSTOK**, a town of Russian Poland, province of Grodno, on the Bialy, 45 miles S.W. of Grodno. It is a well-built, handsome town, and has among its edifices a palace which belonged to the Counts of Branicki, and was once known as the Polish Versailles. Pop. (1897), 63,927.

BIANCHINI, **FRANCESCO**, born at Verona, 1662, studied mathematics, physics, anatomy, and botany, at first under the Jesuits, afterwards (1680) at Padua. He was intended for the clerical profession, but repaired to Rome, and applied himself to jurisprudence, and continued the study of experimental physics, astronomy, &c., as well as of Greek, Hebrew, &c. Pope Alexander VIII. bestowed on Bianchini a rich benefice, with the appointment of tutor and librarian to his nephew, the Cardinal Pietro Ottoboni. Pope Clement XI. also patronized him, and appointed him secretary to the commission employed in the correction of the calendar. Being on a tour through France, Holland, and England, he formed the idea of drawing a meridian in Italy, from one sea to the other, in imitation of that which Cassini had drawn through France. He was occupied eight years at his own expense in that work; but other employments withdrew his attention from it, and it remained unfinished. He concluded his career with two important works (1727) on the planet Venus, and on the sepulchre of Augustus. He died in 1729.

BIARRITZ, a small seaport town in France, department Basses-Pyrénées, 4 miles from Bayonne, and 1 mile from the railway between France and Spain. Formerly a secluded watering-place, it rose into fame and fashion during the reign of Napoleon III., who chose it as the sea-side residence of the imperial family. Picturesquely situated, it is principally composed of hotels and lodging-houses. Pop. (1880), 3340; (1896), 10,544.

BIAS, one of the seven wise men of Greece, born at Priene, one of the principal cities of Ionia, about 570 B.C. He was a practical philosopher, studied the laws of his country, and employed his knowledge in the service of his friends, defending them in the courts of justice, or settling their disputes. He is said to have died at an advanced age immediately after successfully defending in court one of his friends. The inhabitants of Priene having resolved to abandon the city with their property, Bias replied to one of his fellow-citizens, who expressed his astonishment that he made no preparations for his departure, 'I carry all that is mine with me.'

BIBERACH, a town of Wurtemberg, on the river Riss, 22 miles S.W. from Ulm. It is irregularly built, and with its old walls, still in part remaining, and its old towers and gateways, has quite a mediæval aspect. Among its buildings is a fine church, dating from 1100, and recently restored. The town has important educational institutions, and a richly endowed hospital. The French, under Moreau, defeated the Austrians near Biberach in 1796. There is a monument to the poet Wieland, who was born in the vicinity, and another to the emperor William I. Pop. (1895), 8525.

BIBLE (French *bible*, with similar forms in other languages, from Greek *biblia*, books, from *biblos*, the inner bark of the papyrus, used for writing on, hence a book), the collection of Sacred Writings or Holy Scriptures of the Christians. The older and larger division of these writings is also re-

ceived by the Jews as embodying their faith, and is called the *Old Testament*, or *Scriptures of the Old Covenant*, because the Jewish religion was represented as a compact or covenant between God and the Jews, and the Greek word for covenant (*diathêke*) signifies also *last will* or *testament*. The same figure was applied to the Christian religion, which was considered as an extension of the old covenant, or a covenant between God and the whole human race. The sacred writings peculiar to the Christians are, therefore, called the *Scriptures of the New Covenant*, or the *New Testament*. Protestants and Roman Catholics do not altogether agree as to the books that ought to be admitted into the canon or list of writings belonging to the Old Testament. A certain number of books classed by the former under the head of *Apocrypha* are called by the latter 'deutero-canonical,' as being admitted into the canon at a later date than the rest, but are held to be of equal authority. The books of the Old Testament as they are arranged in the authorized Roman Catholic Latin version, called the *Vulgate* (which see), and declared canonical by the decree of the council of Trent, are as follows, those marked with * belonging to the Apocrypha of the Protestants:—Genesis, Exodus, Leviticus, Numbers, Deuteronomy, Joshua, Judges, Ruth, I Samuel, or I Kings; II Samuel, or II Kings; I Kings, otherwise called III Kings; II Kings, otherwise called IV Kings; I Chronicles, II Chronicles, I Esdras (as it is called in the Septuagint and the Vulgate), or Ezra; II Esdras, or Nehemiah; *Tobit, *Judith, Esther, Job, Psalms, Proverbs, Ecclesiastes, Song of Solomon, or Canticles, *The Book of Wisdom, *Ecclesiasticus, Isaiah, Jeremiah, Lamentations, *Baruch, Ezekiel, Daniel (including the stories of Susanna and Bel and the Dragon), Hosea, Joel, Amos, Obadiah, Jonah, Micah, Nahum, Habakkuk, Zephaniah, Haggai, Zechariah, Malachi, *I Maccabees, and *II Maccabees. The books received by the Jews were divided by them into three classes:—1. The Law, contained in the Pentateuch or five books of Moses, being the first five of the Bible. 2. The Prophets, comprising Joshua, Judges, I and II Samuel, I and II Kings, Isaiah, Jeremiah, Ezekiel, and the twelve minor prophets. 3. The Ceterum, or Hagiographa, that is, *holy writings*, containing the Psalms, the Proverbs, Job, in one division; Ruth, Lamentations, Ecclesiastes, Esther, the Song of Solomon, in another division; Daniel, Ezra, Nehemiah, I and II Chronicles, in a third. These books were written in the Hebrew language, while those which are rejected from the canon as apocryphal by the Protestants are found only in Greek or Latin. Biblical critics often divide the Scriptures of the Old Testament into the Pentateuch, or five books of Moses; the Historical books, from Joshua to Esther inclusive; the Doctrinal or Poetical books of Job, Psalms, Proverbs, Ecclesiastes, and the Song of Solomon; and the Prophetical books consisting of the writings of the four major prophets—Isaiah, Jeremiah, Ezekiel, Daniel, and the twelve minor. There is no difference of opinion between Protestants and Roman Catholics regarding the canon of the New Testament, the books of which consist of the four *Gospels* of St. Matthew, St. Mark, St. Luke, and St. John; the Acts of the Apostles; the epistolary writings known briefly as Romans, I and II Corinthians, Galatians, Ephesians, Philippians, Colossians, I and II Thessalonians, I and II Timothy, Titus, Philemon, Hebrews, James, I and II Peter, I, II, and III John, and Jude; and lastly the Apocalypse or Revelation.

Old Testament.—The books of Moses (or at any rate 'the book of the law') were deposited, accord-

ing to the Bible, in the tabernacle, near but not in the ark: the other sacred writings, it is further supposed, were successively deposited in the same place, as they were written. After the building of the temple, they were placed by Solomon in it. On the capture of Jerusalem by Nebuchadnezzar, the autographs probably perished, but numerous copies were preserved, as is inferred from allusions in writers subsequent to the Babylonish captivity. It is believed by many that the canon of the Old Testament was settled soon after the return from Babylon and the re-establishment of the Jewish religion. This work was accomplished, according to the traditions of the Jews, by Ezra, with the assistance of the great synagogue, who collected and compared as many copies as could be found. From this collation a correct edition of the whole was prepared, with the exception of the writings of Ezra, Malachi, and Nehemiah, which were added afterwards. The first definite statement regarding the contents of the Hebrew canon is by Josephus (about 70 A.D.), who states that it consisted of twenty-two books 'justly believed to be divine'. Allowing for differences of division in early times it is probable that these represent our present Old Testament books, apart from the Apocrypha. It is confidently stated that no existing apocryphal, or non-canonical book is ever appealed to in the New Testament as scriptural, yet the canon was long in considerable uncertainty.

The scriptures were, no doubt, originally written on skins or parchments rolled up into rolls or volumes. The ancient Hebrew characters were considerably different from the more modern square ones with which we are familiar, the latter being probably an importation from the East brought in along with the Chaldee language, and superseding the ancient mode of writing as the one language superseded the other. When the change was made is doubtful—some refer it to the time of Ezra, others think that it was not long anterior to the Christian era. The original Hebrew also was written without what are known as 'vowel points', indicating the true ancient pronunciation; these were only gradually introduced through the labours of the Jewish scholars of what is called the Masoretic period, the system being completed from the sixth to the ninth century, and the present or Masoretic text being thus produced. (See MASORA.) A division of the books into certain sections or chapters is very ancient, but the existing division into chapters and verses is of comparatively modern origin. Cardinal Hugo de Sancto Caro, who flourished in the thirteenth century, is said to have divided the Vulgate into chapters, for convenience of reference, but the present division into verses is said to be based on a similar division introduced by the Masoretic scholars in the middle ages, and adopted by Robert Stephens in his edition of the Vulgate in 1555. The first English translations in which it appeared were the Geneva Bible, the Bishops' Bible, and the Authorized Version of 1611. (See below.) The punctuation is also the work of modern scholars. The most ancient manuscripts of the Hebrew text of the Bible are not much more than seven or eight centuries old; a manuscript in the Bodleian library is thought to be 700 years old; one in the Vatican is supposed to have been written in 973.

The printed editions of the Hebrew Bible are very numerous. The earliest appeared in Italy. The first edition of the entire Hebrew Bible was printed at Soncino, in 1488. The Brescian edition of 1494 was used by Luther in making his German translation. The two Rabbinical Bibles printed at Bromberg are famous, and the editions of Athias, a Jew of Amsterdam, 1661 and 1667, are much esteemed for their beauty and correctness. Van der Hooght,

whose edition is a standard, followed the latter. Kennicott did more than any one of his predecessors to settle the Hebrew text. His Hebrew Bible appeared at Oxford, in 1778-1780, two vols. folio. The text is from that of Van der Hooght, with which 680 MSS. were collated. De Rossi, who published a supplement to Kennicott's edition (Parma, 1784-99, five vols. 4to), collated 958 MSS. The Germans, in recent times, have done much towards correcting the Hebrew text. Dr. S. Davidson's is a handy modern edition of the Hebrew text.

The earliest and most famous version of the Old Testament is the Septuagint, or Greek translation, completed it is believed in the second century A.D. (See SEPTUAGINT.) The Syriac version, called the *Peshito*, was made in the second century after Christ, and is celebrated for its fidelity. The famous Latin version of St. Jerome, known as the Vulgate, was finished in 405. The ancient Chaldee or Aramaic *targums*, that is translations or paraphrases, are also of importance, especially that of Onkelos on the Pentateuch and that of Jonathan Ben Uzziel on the Prophets.

New Testament.—The New Testament, besides being originally written in Greek, also differs remarkably from the Old in this respect, that while the writings comprehended in the earlier collection range over a period of a thousand years, those included in the later were produced almost contemporaneously—most of them probably between A.D. 50 and A.D. 70. The collection consists of twenty-seven writings, ascribed either to apostles or to persons intimately associated with them. Five of the works are in the form of historical narratives, four of which relate from different points of view the story of Christ's life, whilst the fifth describes the formation and extension of the church by the ministry of the leading apostles. Twenty-one are epistolary. Thirteen of these bear the name of St. Paul as their author, nine being addressed to various Christian communities, three (I and II Timothy, and Titus)—called the pastoral epistles—to office-bearers in the church, and one to a private individual (Philemon). The epistle to the Hebrews is anonymous, but was certainly not the work of St. Paul. Seven other letters—one ascribed to James, two to Peter, three to John, and one to Jude—are often known as the catholic (that is, general) epistles, as having been intended for the use of Christians in general. The only remaining work is the Apocalypse or Revelation of St. John. Of these writings the epistles are the earliest in date, and were written to various Christian communities to give advice in special circumstances, to explain points of doctrine, or to warn against mistaken beliefs. They are adapted to the special conditions and mental attitude of those to whom they were addressed; thus in the letters to the Corinthian Christians, who dwelt in Greece, various speculative questions are discussed. The first three gospels, called the *synoptic gospels*, were probably written in or near A.D. 70, that of Mark being perhaps the earliest. They are supposed by many to be all founded on an earlier Greek translation of an Aramaic account of the sayings of Christ which Papias ascribes to Matthew. The fourth gospel is of much later date (about A.D. 100), and has a markedly different character. It gives an account of Christ's life not so much from an objective and historical as from a subjective and personal point of view. (See GOSPEL.)

From the fifth century to the present time the canon of the New Testament has remained unaltered, but if we go back a century farther this unanimity of sentiment is broken. At that time a distinction was made between the *homologoumena* or acknow-

ledged, and the *antilegomena* or *controverted* books; the former including the four gospels, Acts, the Pauline epistles (including Hebrews), I John, I Peter, and, though with some hesitation, the Apocalypse. The earliest list we possess of the books of the New Testament emanating from the orthodox church is the Muratorian canon (A.D. 180-170); and in it Jude, II and III John, the Apocalypse, and another Apocalypse (that of Peter) are included, whilst I Peter is omitted. Of still earlier date is the heretical canon of Marcion (about 140 A.D.), which embraces only a gospel based on that of Luke and ten of the Pauline epistles. Various early notices group the writings under the two general divisions of *evangelical* and *apostolic*; and the more detailed information obtained from the oldest extant MSS., versions, and catalogues of books exhibits substantially the same arrangement as that now followed in our bibles. Few copies, however, contained the whole of the New Testament; most frequently the Gospels were in one volume, the Acts and Epistles in another, whilst the Apocalypse was comparatively seldom associated with the other books. The general order of the books was Gospels, Acts, Catholic Epistles, Pauline Epistles, Apocalypse; from which arrangement, however, there are individual deviations, especially as regards the book of Acts. The four gospels are almost constantly in their familiar order; and in the Pauline epistles the letter to the Hebrews exhibits almost the only variation, being sometimes—and indeed most frequently—inserted before the pastoral epistles. (See also CANON.) Besides the books with which we are familiar there were many others, such as The Shepherd of Hermas, the Epistle of Barnabas, the Acts of Paul, the Revelation of Peter, and the Teachings of the Apostles, which long held a doubtful position in regard to apostolic authority; and it was not till the Council of Laodicea (360 A.D.) that their use was definitely forbidden.

The originals of the writings now collected in the New Testament do not seem to have remained long in existence. There is no certain mention of them in the early fathers; for the two passages in Ignatius and Tertullian which have been supposed to refer to them, apply to the Old Testament as contrasted with the New, and to the Greek as contrasted with the Latin translation. Although the originals have thus vanished, we may form some approximate idea of their outward appearance. The material was probably paper (II John, 12), made of the Egyptian reed or papyrus; parchment, though not unknown (II Timothy, iv. 13), being at that time too dear for ordinary use. Ink and the reed-pen are mentioned in III John, 13. The sheets when written were made up in the form of a roll. The text was written in columns, and the writing was continuous, without any interval between the words, and without any system of punctuation. The characters were what are known as *uncial*, consisting wholly of large, erect, square or but slightly rounded, capitals. The different writings were speedily multiplied by means of copies; and it is from such of these copies as have been preserved, taken in connection with ancient versions and quotations in the writings of the fathers, that we are enabled to ascertain or approximate to the true text. The oldest manuscripts extant are referred to the fourth century, and on comparing these with later ones we find that various changes were introduced. All the manuscripts of the New Testament are in the volume form consisting of folded sheets, and not in rolls. The division into columns was at first retained, but the number of columns varied. The uncial characters by degrees lost their stiffness and uprightness, and by the tenth century the smaller cursive writing prevailed. It was but seldom that

a codex contained the whole New Testament; and if it did, it probably embraced the Septuagint also. (See CODEX.) Only four of the uncials, and but few even of the cursives, approach completeness. Many of the manuscripts have glosses on the margin, or even a continuous chain of patristic comments. Punctuation came into general use about the eighth century, but no uniform system existed for several centuries. Our present mode was only established after the beginning of the sixteenth century by the Venetian printers, Aldus and Paulus Manutius, and was applied to the New Testament by Erasmus and R. Stephens. The need of some division of the text for purposes of reference was early felt, and so we find that various systems of division were introduced at different periods. Our modern arrangement of chapters, already referred to, was made by the Spanish cardinal, Hugo de Sancto Caro (died 1268). The subdivision into verses, as we now have it, was established by Robert Stephens in 1555. The titles and subscriptions of the books form no part of the original text, and they merely represent the ancient tradition as to the authorship of the books. The subscriptions in the case of some of the epistles are demonstrably erroneous.

During the fourteen hundred years, of our era preceding the invention of printing, the text of the New Testament was preserved and transmitted by means of manuscript copies; and the transcribers were liable to the various possibilities of error incident to such a process, the text naturally underwent numerous minute changes or variations in the course of frequent transcription. For long the existence of various readings was almost unknown, but in 1709 Dr. Mill announced that he had collected 80,000 for his edition. This number has since been greatly enlarged, and now not less than 120,000 are recorded. In deciding the correct text in such cases our chief authorities are the manuscripts. Their value depends partly on their antiquity and partly on other considerations, internal and external. The number of the uncial or older manuscripts (down to the tenth century), after deducting duplicates, is 127, and there are in all about 1500 cursives. For convenience of reference the former are designated by letters of the Roman or Greek alphabet, the latter by numerals. Among the leading are the Codex Alexandrinus (A), now in the British Museum, assigned to the first half of the fifth century; Codex Vaticanus (B), in the Vatican Library, assigned to the fourth century; Codex Ephraemi (C), a palimpsest in the Imperial Library at Paris, of the fifth century; Codex Bezae (D), for the Gospels and Acts), a Græco-Latin MS. in Cambridge University Library, assigned to the sixth century; and the Codex Sinaiticus, discovered by Tischendorf in 1859, believed to be at least as old as B. After manuscripts come the ancient versions, of which the chief are two Syriac translations, the Peshito and the Philoxenian; two Egyptian, the Memphitic and the Sahidic; the Ethiopic; the Gothic of Ulfilas (very fragmentary); the different remains of the version known as the old Latin, and the Vulgate (which see). A third authority consists in the citations of the books in the works of the fathers, but this is much less reliable than the other two. The Greek New Testament was first printed on the eve of the Reformation in two nearly contemporary editions, that of the Complutensian Polyglot projected by Cardinal Ximenes (1514), and that of Erasmus (1516). Erasmus issued other editions, and was followed by the learned Parisian printer, Robert Stephens, whose great edition (1550), designated Regia (Royal), presented the first systematic collection of various readings. Beza's edition of 1580 and that of Stephens of 1550 were the chief authorities

on which the English Authorised Version of 1611 was based. The celebrated Elzevir editions appeared at Leyden in 1624 and 1683. Subsequent editions of importance were Walton's Polyglot (1657), Dr. Mill's (1709), Bengel's (1784), and Wetstein's (1751), followed by the celebrated Griesbach's, who published his editions in 1774-75, 1796-1808. Lachmann's larger edition appeared in 1842-50, and was followed by Tischendorf's, one of the most important of all, and that of Tregelles (1857-59). Westcott and Hort's edition, which does not greatly differ from Tischendorf's, appeared in 1881. Another recent text is that which gives the readings adopted in the Revised Version of 1881.

All the books of the New Testament have come down to us as originally written in the Greek language. The Greek of the New Testament, however, differs considerably from that of the classical writers, and belongs to what was called the *common dialect*, that form which the language assumed after the Macedonian supremacy had brought the various Greek-speaking communities under a common rule. The writers of the New Testament were all, or nearly all, Jews; and while employing the Greek language, they exhibit many traces of their native idiom, so that their writings present more or less of a Hebraic colouring. The *body*, as has been well said, is Greek; the *spirit* is Hebrew. The language of the authors of the New Testament was powerfully influenced by that of the Septuagint, but it was more idiomatic. The New Testament writers frequently use well-selected Greek terms, which the Alexandrian translators have not employed; and form their phrases in accordance with genuine Greek idiom, where the Septuagint keeps by the Hebrew. The Hellenistic idiom in the Septuagint moves in the fetters of a close translation; in the New Testament it exhibits the freedom and flexibility of original composition.

English Translations.—Paraphrases of portions of the Bible into Anglo-Saxon alliterative metre were made by Caedmon, and are still extant, and we possess also the Psalms, the Gospels, and other portions of Scripture in Anglo-Saxon. Wicliffe's translation, made by the reformer in conjunction with a coadjutor, Nicholas de Hereford, was begun about 1350, and completed in 1380. A revised and improved edition of this was executed by John Purvey, Wicliffe's friend, and finished in 1388. The first printed version of the New Testament in English was the translation of William Tindall, or Tyndale, one of the early martyrs to the Reformation. Before his exile from England, Tindall had revolved in his mind this work, by which he proposed that he should make 'the boy that driveth the plough to know more of the Scriptures than the priests'. He executed it during his residence on the Continent, where his last years were spent in labours and travels connected with this enterprise. His New Testament was partly printed at Cologne in 1526, the complete edition appearing at Worms. Other editions were printed in different continental cities—Hamburg, Antwerp, Strasburg, Nürnberg, &c.—at different dates. It was proscribed and burned in England, but copies were smuggled over and used in secret. The Pentateuch was also published by Tindall in 1530, a second edition in 1534. He also translated some of the prophetic books. His translation was superior to all previous versions in purity, perspicuity, and accuracy, and it formed the basis of all subsequent translations, particularly of the Authorized Version. The first printed English translation of the entire Bible was published by Miles Coverdale in 1535. It was undertaken at the instance of Cromwell in opposition to Tindall's translation, and being made, not from the originals, but

from German and Latin versions, was inferior to Tindall's. It is in black-letter and contains the Apocrypha. After the death of Tindall, John Rogers, who was the first to suffer death for his religion in the reign of Queen Mary, undertook the completion of his translation of the Old Testament, and the preparation of a new edition. In this edition the latter part of the Old Testament (after II Chronicles) was based on Coverdale's version. It was printed at Antwerp, in black-letter, and the translator's name was given as 'Thomas Matthew'. Through the influence of Archbishop Cramer it was allowed to be published in England and was dedicated to Henry VIII. It was in one volume folio, dated 1537, and contained useful prefatory matter and marginal notes. A second edition appeared in 1538; and a revised edition was published in 1539, under the superintendence of Richard Taverner, who also added matter of his own. In the same year as Taverner's another edition appeared, printed by authority, with an engraving, said to be by Holbein, on the title-page, in costly type, and forming a sumptuous folio, with a preface by Cramer, and hence called Cramer's Bible, otherwise the Great Bible. This was the first Bible printed by authority in England, and a royal proclamation in 1540 ordered a copy of it to be placed in every parish church. This continued, with various revisions, to be the authorized version till 1568. In 1557 an English translation appeared at Geneva, beginning with the New Testament, based on Tindall's, and completing the entire Bible in three years. This was the work of Whittington, Coverdale, Goodman, John Knox, and other exiles. It was accompanied by notes of a polemical and Calvinistic tendency. It was commonly called the Geneva Bible, but became even better known by another title, the Breeches Bible, from its rendering of the last clause of Genesis iii. 7: 'They sewed fig-tree leaves together and made themselves breeches'. This version was generally adopted by the Puritan party, and was for sixty years the most popular in England. It was allowed to be printed in England under a patent of monopoly in 1561. It was the first printed in Roman letters, instead of the old black-letter, which reduced its bulk and price. It was also the first English edition (as already mentioned) to adopt the plan of a division into verses. It omitted the Apocrypha, left the authorship of the epistle to the Hebrews open, and put words not in the original in italics.

The Bishops' Bible, published 1568 to 1572, was based on Cramer's, and revised by Archbishop Parker and eight bishops. It succeeded Cramer's as the authorized version, and was rendered as attractive as profuse illustration and expensive getting up could render it, but this made it inaccessible to the people, and it did not commend itself much to scholars. In 1582 an edition of the New Testament, translated from the Latin Vulgate, appeared at Rheims, and in 1609-10 the Old Testament, with notes, was published at Douay. This is commonly called the Douay Bible, and is the English version recognized by the Roman Catholic Church. It professed to be based on a greater respect for the Septuagint, the Vulgate, and other ancient translations, than the previous English versions, and was accompanied by notes as dogmatic as those of the Geneva Bible. In one respect it was markedly deficient, in purity of English diction.

In the reign of James I. a Hebrew scholar, Hugh Broughton, insisted on the necessity of a new translation, and at the Hampton Court Conference (1604) the suggestion was made by Dr. Rainolds of Oxford, as spokesman of the Puritan representatives, and accepted by the king. The work was committed to

fifty-four scholars, but only forty-seven took part in it. They were divided into six companies, who had their respective tasks assigned them and met apart. The revision was begun in 1807, and occupied three years. The whole work was revised by twelve of the translators, two out of each company, and a final revision was made by Dr. Myles Smith, the writer of the preface, and Dr. Bilson, bishop of Winchester. The completed work was published in a folio volume in 1811. The translators were enjoined to follow the ordinary Bible read in the churches commonly called the Bishops' Bible, and not to make alterations unless the meaning of the original could be more accurately conveyed. The general accuracy of this translation, which is usually known as the Authorized Version, and the purity of its style, so won the approbation of scholars, and commended it to readers generally, that from the time of its adoption it has superseded all other versions. This general adoption, however, which no previous authorized version had succeeded in obtaining, though evidently resting more on its own merits than on official sanction, has probably had an injurious effect on the critical study of the Bible, which the continued use of a variety of versions must have tended to foster. Latterly, however, the advances made in Hebrew scholarship and biblical criticism gave rise to a general demand among those interested in the study of the Bible for a revision of the Authorized Version, and the task was undertaken by a number of the Anglican clergy, with the aid of associates from various other bodies. The work was set afoot by the convocation of Canterbury, who in 1870 appointed a committee to consider the question of revision. The committee in a few months reported favourably on the scheme, recommending that 'the revision be so conducted as to comprise both marginal renderings and such emendations as it may be found necessary to insert in the text of the authorized version'; stating also 'that in the above resolutions we do not contemplate any new translation of the Bible, or any alteration of the language, except where in the judgment of the most competent scholars such change is necessary'. Two companies were soon formed—one for the Old, the other for the New Testament, including a number of scholars belonging to America—and the revised version of the New Testament was issued in 1881, while that of the Old Testament appeared in 1885. In accuracy at least the revised version is greatly superior to the old, but probably it will not supersede it. Of other translations than the English Authorized Version, that of Luther, which formed an epoch in the history of the German language, is the most remarkable. It was finished in 1534. For translations in different languages see next article.

BIBLE SOCIETIES, societies formed for the distribution of the Bible or portions of it in various languages, either gratuitously or at a low rate. A clergyman of Wales, whom the want of a Welsh Bible led to London, occasioned the establishment of the British and Foreign Bible Society, which was founded in London, March 7, 1804. A great number of similar institutions were soon formed in all parts of Great Britain, and connected with the former as a parent society, to support it with pecuniary contributions, and to receive, in return, a supply of Bibles. On the Continent of Europe, in India, in the Australian colonies, in Canada and elsewhere, similar societies have been formed, and are connected with the home society, which is by far the largest of the kind in the world. It carries on the distribution of the Scriptures, partly directly, by means of agents of its own established in the different countries, under whom are colporteurs who disseminate the society's

publications among the people; and partly indirectly, by the assistance it gives to other associations of various kinds, all engaged in work more or less akin to its own. Thus churches engaged in missionary or home work are everywhere indebted to the British and Foreign Bible Society for assistance lent, and in particular the Society for the Propagation of the Gospel in Foreign Parts and the Church Missionary Society, which between them use some seventy languages in their missions, are for sixty out of those seventy languages entirely dependent upon the Bible Society. Other institutions aided by free grants of books, or of books at reduced prices, include such as the missions to seamen, soldiers, and fishermen, Young Men's Christian Associations, missionary societies, the Salvation Army, Dr. Barnardo's Homes, &c.; while grants of money are made directly to the expenses of Bible-women in London and to several societies for the employment of Bible-women in the East, such as the Church of England Zenana Missionary Society, and the Zenana Bible and Medical Mission. Since the formation of this great society in 1804 the translation, printing, and distribution of the whole or part of the Bible has been promoted by it directly in 286 languages or dialects, and indirectly in other 65, making a total of 351, exclusive of different versions and revisions in the same language or dialect. Among the European languages in which the whole Bible has been circulated are Welsh, Gaelic, Irish, Manx, French, Spanish, Portuguese, Italian, Flemish, Dutch, Danish, Norwegian, Swedish, Icelandic, German, Russian, Polish, Bohemian, Hungarian, Modern Greek, Ancient Greek, Turkish, Roumanian, Servian, Bulgarian. In some cases the whole Bible has been translated on behalf of a comparatively small population. Thus, to mention only European tongues, we have separate versions for the use of the Lithuanians, the Wends of Saxony, Lusatia, the Wends of Prussian Lusatia, the Romanians of the Engadine, the Romanians of the Grisons, the Lapps, the Finns, the Livonians, and the Estonians. Among the languages of Asia the Bible has been translated into Armenian (ancient and modern), Arabic, Syriac, Persian, Sanskrit, Hindustani, Bengali, Hindi, Uriya (Orissa), Telugu, Kanarese, Tamil, Malayalam, Marathi, Gujarathi, Singhalese, Assamese, Burmese, Chinese, Mongol, Japanese, and Malay. There are also versions in Maori, Fijian, and several other languages of the Pacific islands; in Abyssinian (Amharic), Swahili, Malagasi, Sechuana, Zulu, and one or two other languages of Africa; in Eskimo and Cree among American tongues; while many of the languages in which portions of the Scriptures have been circulated by or through the society are unknown to ordinary readers even by name. In many cases the society has been instrumental in getting languages reduced to a written form for the first time in order to provide the people using them with the Scriptures. The society has a large annual income, arising partly from subscriptions, donations, legacies, &c., and partly from the sale of its publications, which, of course, are often sold at a loss. Latterly its annual expenditure has been usually about £200,000, and in one year rose as high as £240,000. Altogether, from its commencement to 1898, its expenditure amounted to £12,744,000. For the year ending March 31, 1898, the income amounted to £229,749, the expenditure to £221,867. The total issue of the society in the same year of Bibles and portions of the Bible was 4,387,152, there being 2,073,467 of these issued from the Bible House, London, and the rest from the depôts abroad. The aggregate of the society's issue now amounts to about 180,000,000. At the beginning of the nineteenth century it is probable that there were not more than 4,000,000 or 5,000,000

copies of the Scriptures in the world, the number of translations then employed for the Bible amounting to about fifty. Since the establishment of the British and Foreign Bible Society about 180,000,000 copies of the Word of God, in whole or in part, have, as just mentioned, been circulated by it directly; while other kindred societies which have sprung out of it, or acted in concert with it, have distributed 94,000,000 copies more; so that during the nineteenth century the total number of copies or portions of the sacred Scriptures distributed in this way has amounted to about 254,000,000.

The Edinburgh Bible Society was established in 1809, and up to 1828 was connected with the British and Foreign Bible Society. It then took up a separate position, and remained independent till in 1861 it united with the National, the Glasgow, and other Bible societies, into a whole called the National Bible Society of Scotland, having its head-quarters in Edinburgh and Glasgow. The revenue of the society is between £30,000 and £40,000, and the yearly circulation of Bibles and portions of Scripture about 800,000. The society has many auxiliaries, and circulates the Scriptures in Great Britain and colonies, on the Continent, and in China, Japan, &c. The total issue is now over 12,000,000. The Hibernian Bible Society, which has its head-quarters in Dublin, was established in 1806. Its object is to encourage a wider circulation of the Holy Scriptures, without note or comment, in Ireland.

On the Continent of Europe the principal Bible societies are the Prussian, which was established at Berlin in 1805, and has issued over 3,000,000 copies; the Württemberg, instituted in 1812, with auxiliaries; the Berg (Elberfeld), instituted 1813; the Saxon, 1814; the Netherlands, 1815; and the Swedish. The Russian Bible Society in St. Petersburg, founded in 1813, vied with the British, and printed the Bible in thirty-one languages and dialects spoken in the Russian dominions; but it was suppressed by an imperial ukase in 1826. A new Bible Society was then instituted at St. Petersburg—namely, the Russian Evangelical Bible Society, which supplies the Bible to Russian Protestants. The British and Foreign Society has colporteurs in the country. In 1817 the distribution of the Bible by such societies was forbidden in Austria, and those already existing in Hungary were suppressed. Italy, Spain, and Portugal have had as yet no Bible societies; but the British societies are energetic in providing them with Bibles in their own tongues.

In the United States of America the great American Bible Society, formed in 1816, acts in concert with the auxiliary societies in all parts of the Union. The annual income of the society is now over £100,000, and its total issue has amounted to about 64,000,000 copies. These have been mostly in English, Spanish, and French, from the society's plates. The managers have occasionally purchased Bibles in Europe, and issued them to applicants, in German, Dutch, Welsh, Gaelic, Portuguese, modern Greek, and some other European languages. They have also furnished money to print translations into pagan languages, by American missionaries. It is the object of the society to supply everyone who can read in the United States, before devoting much attention to distribution abroad. Yet Spanish America and Ceylon, Greece, and the Sandwich Islands have been furnished with Bibles by the society. Other American societies are the Pennsylvania Bible Society, the American and Foreign Bible Society, and the American Bible Union.

BIBLIOGRAPHY signifies the knowledge of books, in reference to the subjects discussed in them, their different degrees of rarity, curiosity, reputed and real value, the materials of which they are com-

posed, and the rank which they ought to hold in the classification of a library. It is therefore divided into two branches, the first of which has reference to the contents of books, and may be called, for want of a better phrase, *intellectual* bibliography; the second treats of their external character, the history of particular copies, &c., and may be termed *material* bibliography. The object of the first branch is to give information regarding the most valuable books in every department of study by means of catalogues.

Bibliography has been, and still is, cultivated most successfully in France. This is owing partly to the riches of the great and daily increasing public libraries, liberally thrown open to the use of the public, partly to the large number of fine private collections. Brunet's well-known *Manuel du Libraire* was the first important work which contained, in an alphabetical form, a list of the most valuable and costly books of all literatures; Barbiér's *Dictionnaire des Ouvrages Anonymes*, the first systematic and satisfactory treatise on this subject; Renouard's *Catalogue d'un Amateur*, the first, and for a long time the best guide of the French collectors; the *Bibliographie de la France*, the first work which showed how the yearly accumulation of literary works can be recorded in the most authentic manner. No less valuable are the works of Peignot, Petit Radet, Renouard on the Aldines (see ALDINE EDITIONS), and various others. Among more recent French works may be cited *Bibliographie de la France*, a periodical publication commenced in Paris in 1810. H. Boissang, *Ma Bibliothèque Française* (Paris, post 8vo, 1856), gives a list of standard editions of the best French authors. I. M. Quérard, *La France Littéraire ou Dictionnaire Bibliographique*, an account of the literature of the eighteenth and nineteenth centuries (ten vols. 8vo, Paris, 1827-39); Quérard, *La Littérature Française Contemporaine* (1827-49); Brunet's *Manuel du Libraire* (new edition, six vols. 8vo, Paris, 1860-65); E. Hatin, *Bibliographie de la Presse Périodique Française* (one vol. 8vo, Paris, 1866); Lorenz, *Catalogue Général de la Librairie Française depuis 1840*, giving French publications from 1840 to 1899.

In England, although it contains many rich public and private collections, bibliography has not been so successfully cultivated as in France. The most extensive catalogues of books which it can boast of are those of the Bodleian Library, the British Museum, the Advocates' Library, Edinburgh, the Harleian Library (compiled partly by Dr. Johnson), &c. Catalogues compiled on a scientific system, by which the reader is assisted in his researches after books on a particular subject, are not numerous in English, but we may mention Sonnenschein's *The Best Books* (1891), and *Guide to Contemporary Literature* (1895), presenting classified lists of about 100,000 works. The most splendid catalogue perhaps ever published is that of the Earl of Spencer's Library, compiled by Dibdin, in four large volumes, with numerous engravings. Among English bibliographical works are the *Typographical Antiquities of Ames, Herbert, and Dibdin*; Dr. Adam Clarke's *Bibliographical Dictionary and Miscellany* (1803-6, eight vols.); Dibdin's *Introduction to the Knowledge of Rare and Valuable Editions of the Classics* (latest edition, 1827, two vols.); Brydges' *Censura Litteraria* (1805), and British Bibliographer (1818); Beloe's *Anecdotes of Literature* (1807); Savage's *Librarian* (1808); Dibdin's *Bibliographical Decameron* (1817); and *Tour in France and Germany* (1821); Horne's *Introduction to the Study of Bibliography* (1814); Dr. Robert Watt's *Bibliotheca Britannica* (1824, four vols. 4to), a work of stupendous labour and great utility; Joseph W. Moes's *Manual of Classical*

Bibliography (1825); Darling's *Cyclopædia Bibliographica* (chiefly theological literature, 1854); A *Bibliographical and Critical Account of the Rarest Books in the English Language*, by J. Payne Collier, F.S.A. (two vols. 8vo, London, 1855); Lowndes' *Bibliographer's Manual*, edited by H. G. Bohn (London, 1859, six vols.); S. A. Allibone's *Critical Dictionary of English Literature and British and American Authors* (Philadelphia, 1859-71, three vols., and two of Supplement, 1891); Halkett and Laing's *Dictionary of the Anonymous and Pseudonymous Literature of Great Britain* (1882-88, four vols.); Sampson Low's *English Catalogue of Books*, which in a series of successive volumes catalogues the British books published from 1835 onwards to the present time; &c.

American literature, although of comparatively recent origin, has already given rise to a pretty extensive series of bibliographical works on both sides of the Atlantic. We may cite—*Bibliographical Catalogue of Books, &c.*, in the *Indian Tongues of the United States* (8vo, Washington, 1849); Duyekink's *Cyclopædia of American Literature* (two vols. royal 8vo, New York, 1856); Ternaux-Compans, *Bibliothèque Américaine* (8vo, Paris, 1837); Trubner's *Bibliographical Guide to American Literature* (London, 1856); and the *General American Catalogue of Leypoldt and Jones* (1880, with continuations).

The learned Germans, little assisted by public and almost entirely destitute of private collections, consulting only the real wants of the science, have actively endeavoured to promote it. Ersch is the founder of German bibliography. He gave it a truly scientific character by his extensive work, *Allgemeines Repertorium der Literatur* (Universal Repertory of Literature, 1793-1807), and by his *Handbuch der Deutschen Literatur* (Manual of German Literature). German bibliography is particularly rich in the literature of separate sciences; and the bibliography of the Greek and Latin literature, as well as the branch which treats of ancient editions, was founded by the Germans. The first attempt, in Germany, to prepare a universal bibliographical work was made by Ebert. The following are valuable German bibliographical works in particular departments of science and literature:—T. A. Nessel's *Anweisung zur Kenntniss der Besten Allgemeinen Bucher in der Theologie* (fourth edition, Leipzig, 1800), and the continuation of it by Simon (Leipzig, 1813); C. F. Burdach's *Literatur der Heilwissenschaft* (Gotha, 1810, two vols.); W. Gf. Ploucquet's *Literatura Medica* (Tubingen, 1806, four vols. 4to); T. G. Meusel's *Bibliotheca Historica* (Leipzig, 1782-1802, eleven vols. in twenty-two vols., not finished); his *Literatur der Statistik* (Leipzig, 1816, two vols.); G. R. Bohmer's *Bibliotheca Scriptorum Historie Naturalis* (Leipzig, 1785-99, seven vols.); Alb. Haller's *Bibliotheca Botanica* (Zurich, 1771, two vols. 4to), *Anatomica* (Zurich, 1774, two vols. 4to); *Chirurgica* (Bern, 1774, two vols. 4to); and *Medicæ Practicæ* (Bern, 1776, et seq., four vols. 4to); &c.; R. Buckner's *Bibliographisches Handbuch der Deutschen Dramatischen Literatur* (4to, Berlin, 1837); W. Engelmann's *Bibliotheca Geographica* (two vols. 8vo, Leipzig, 1858), a classified catalogue of all works in geography and travels published in Germany from the middle of the fourteenth century down to 1856, with prices, index, &c.; W. Engelmann's *Bibliotheca Philologica* (third edition, 8vo, Leipzig, 1853) contains a list of Greek and Latin grammars, from 1750 to 1852; the same writer has published bibliographical works on mechanical technology, medicine, economy, veterinary art, geography, zoology, palæontology, &c.; W. Heinisius' *Allgemeines Bucherlexikon*, an extensive work forming (with its

continuations) an alphabetical catalogue of all the books published in Germany from 1700 to 1888, with sizes, prices, and publishers' names; and Keyser's *Vollständiges Bucherlexikon*, giving books published between 1750 and 1882.

Directions for the study of bibliography are contained in Achard's *Cours Élémentaire de Bibliographie* (1807, three vols.), Th. Hartwell Horne's *Introduction to the Study of Bibliography* (1814, two vols.), and Brunet's *Connaissances Necessaires à un Bibliophile* (Paris, 1878).

Material Bibliography, often called by way of eminence *bibliography*, considers books in regard to their exterior, their history, &c., and has been principally cultivated in France and England. The different branches of material bibliography (see also **BIBLIOMANIA**) may here be mentioned:—the knowledge of the ancient editions (*incunabula*, or, if classical authors, *editiones principes*), some of the best works on which are G. Wfg. Panzer's *Annales Typographici* (Nurnberg, 1783-1803, eleven vols. 4to), coming down to 1536; the *Annales Typographici*, by Maittaire (Hague, 1719, et seq., eleven vols. 4to), which not only contains the titles, but investigates the subjects of works. More exact descriptions of particular ancient editions are found in Serna Santander's *Diction. Bibliogr. du 15ième Siècle* (Brussels, 1805, three vols.); Kossius' *Catalogus Codicum*, sec. 15, *Impressor. Bibliothecæ Magliabecchianæ* (Florence, 1793, three vols. fol.), and others. The study of rare books, on account of the vague principles on which it rests, is more difficult than is generally believed, and easily degenerates into superficial and capricious trifling. This has been more injured than promoted by I. Vogt's *Catalogus Librorum Rariorum* (Frankfort and Leipzig, 1793), and J. Jac. Bauer's *Bibliotheca Libror. Rarior. Universalis* (Nurnberg, 1770-91, twelve vols.). We may also mention here the catalogues of the books prohibited by the Roman Church (*Indices Librorum Prohibitorum et Expurgetorum*). For the discovery of the authors of anonymous and pseudonymous works, we may use Barbier's *Dictionnaire des Ouvrages Anonymes et Pseudonymes* (Paris, 1806-9, four vols.), which is valuable for its accuracy (but it contains only French and Latin works); Quérard's *Dictionnaire des Ouvrages Polyonymes et Anonymes de la Littérature Française* (Paris, 1854-56), and his *Supercheries Littéraires Dévoilées* (five vols. Paris, 1845-56). We need not observe what an important source of information in the department of bibliography are literary journals. See **BIBLIOMANIA**.

BIBLIOMANCY, divination performed by means of the Bible, also called *sortes biblicæ*, or *sortes sanctorum*. It consisted in taking passages at hazard, and drawing indications thence concerning things future. It was much used at the consecration of bishops. It was a practice adopted from the heathens, who drew the same kind of prognostications from the works of Homer and Virgil. In 465 the Council of Vannes condemned all who practised this art to be cast out of the communion of the church; as did the Councils of Agde and Auxerre. But in the twelfth century we find it employed as a mode of detecting heretics. In the Gallican Church it was long practised in the election of bishops; children being employed, on behalf of each candidate, to draw slips of paper with texts on them, and that which was thought most favourable decided the choice. A similar mode was pursued at the installation of abbots and the reception of canons; and this custom is said to have continued in the cathedrals of Ypres, St. Omer, and Boulogne, as late as the year 1744. In the Greek Church we read of the prevalence of this custom as early as the consecration of Athanasius.

on whose behalf the presiding prelate, Caracalla, archbishop of Nicomedia, opened the Gospels at the words, 'For the devil and his angels' (Mat. xxv. 41). The Bishop of Nice first saw them, and adroitly turned over the leaf to another verse, which was instantly read aloud: 'The birds of the air came and lodged in the branches thereof' (Mat. xiii. 32). But this passage appearing irrelevant to the ceremony, the first became gradually known, and the Church of Constantinople was violently agitated by the most fatal divisions during the patriarchate.

BIBLIOMANIA ('book-madness'), a word formed from the Greek, and signifying a passion for possessing rare or curious books. The true bibliomaniast is determined in the purchase of books less by the value of their contents than by certain accidental circumstances attending them. To be valuable in his eyes they must belong to particular classes, be made of singular materials, or have something remarkable in their history. Some books acquire the character of belonging to particular classes from treating of a particular subject; others from something peculiar in their mechanical execution (as the omission of the word 'not' in the seventh commandment, which gives the Wicked Bible its name), or from the circumstance of having issued from a press of uncommon eminence, or because they once belonged to the library of an eminent man. But there are certain fashions in bibliomania, and books that are much sought after at one time may at another be comparatively neglected. Some collections of books may possess or have possessed much intrinsic value; such as collections of the various early editions of the Bible; collections of editions of single classics (for example, those of Horace and Cicero); the editions of the Greek and Latin classics in *usum Delphini* and *cum notis variorum*; the editions of the Italian classics printed by the Academy *della Crusca*; works printed by the Elzevirs and by Aldus; the classics published by Maittaire or Foulis; and the celebrated Bipont editions, with others. It perhaps was more customary in former times than at present to make collections of books which have something remarkable in their history (for example, books which have become very scarce, and such as have been prohibited), yet various scarce books are highly prized on account of nothing but their rarity, the original (1788) Kilmarnock edition of Burns's Poems, for instance. First editions may be ranked in the same class. Books distinguished for remarkable mutilations have also been eagerly sought for. Those which appeared in the infancy of typography called *incunabula*, from the Latin *cunæ*, a cradle, and among them the first editions (*éditiones principes*) of the ancient classics, are still in general request. An enormous price is frequently given also for splendid proof impressions of copperplate engravings, and for coloured impressions, for works adorned with miniatures and illuminated initial letters; likewise for such as are printed upon vellum. Works printed upon paper of uncommon materials, or various substitutes for paper (sbestos, for instance), have been much sought after; likewise those printed upon coloured paper. Other books in high esteem among bibliomanists are those which are printed on large paper, with very wide margins. In English advertisements of rare books some one is often mentioned as particularly valuable on account of its being 'a tall copy'. If the leaves happen to be uncut the value of the copy is much enhanced. Other works highly valued by bibliomanists are those which are printed with letters of gold or silver, or ink of singular colour; for example, (1) *Faati Napoleonei* (Paris, 1804, 4to), a copy on blue vellum paper, with golden letters; (2) *Magna Charta* (London, Whitaker, 1816, folio), three copies upon purple-coloured vellum, with golden letters.

Bibliomania often extends to the binding. In France the bindings of Derome, Padeloup, and Bozerian are highly valued; in England those of Charles Lewis and Roger Payne, among eighteenth-century binders; while Hayday, Rivière, Bedford, and Zaehnsdorf may be mentioned as among the notable craftsmen of the nineteenth. Even the edges of books are often adorned with fine paintings. Many devices have been adopted to give a factitious value to bindings. Jeffery, a London bookseller, had Fox's History of King James II. bound in fox-skin, in allusion to the name of the author; and the famous English bibliomaniast Askew even had a book bound in human skin. In the library of the castle of Königsberg are twenty books bound in silver (commonly called the *silver library*). These are richly adorned with large and beautifully-engraved gold plates, in the middle and on the corners. To the exterior decoration of books belongs the bordering of the pages with single or double lines, drawn with the pen (*exemplaire réglé*), commonly of red colour—a custom which we find adopted in the early age of printing in the works printed by Stephens. The custom of colouring engravings has generally been dropped, except in cases where the subject particularly requires it (for instance, in works on natural history, or the costumes of different nations), because the colours conceal the delicacy of the engraving.

Other means of idle competition being almost all exhausted, a new method of gratifying the bibliomaniast taste was adopted, that of enriching works by the addition of engravings—illustrative indeed of the text of the book, but not particularly called for—and of preparing only single copies. Books are often mutilated in this way to enrich some other book. Such 'grangerized' copies have long been well known.

Among book auctions at which the bibliomania raged with the greatest fury was that of the library of the Duke of Roxburghe in London, 1812. Every work was bought at an almost incredible price. For instance, the first edition of Boccaccio's Decameron, published by Valdarfer in 1471, was sold for £2260 sterling—at that time a 'record' price. In memory of this auction the Roxburghe Club was founded in the following year, of which Lord Spencer was president. It met yearly on the 13th of July, the anniversary of the sale of the Boccaccio in the St. Alban's Tavern. The fortunate purchaser of the Decameron at this sale was the Marquis of Blandford; at his death, in 1819, it was sold for £918, 15s., and ultimately came into the possession of Earl Spencer, who had bid £2260 for it at the great sale. We may compare this with two similar auctions that took place near the end of the same century, namely, those of the Earl of Jersey's Osterley Park Library in 1885 and the Earl of Ashburnham's Library in 1897-98. At the former the only known perfect copy of Caxton's Romance of King Arthur realized £1950, and Caxton's translation of Le Fevre's Histories of Troy was sold for £1830; another work printed by Caxton, Gower's Confessio Amantis, was disposed of for £810. At the latter sale a Mazarin Bible on vellum (date 1450-55) realized £4000, and a record price was obtained for a Caxton, namely, £2100 for a perfect copy, with rough edges, of Le Fevre's Boke of the Hoole Lyf of Jason, translated and printed by him (1477). Other prices at this sale were £1850 for a Biblia Panperum (block-book, 1430); £1500 for the first Latin Bible with a date (1462), on vellum; £1820 for a perfect copy of Caxton's first edition (1477) of the Dictes and Sayings of the Philosophers; and £1000 for Dunn Gardner's copy (perfect) of Wynkyn de Worde's edition of Chaucer's Canterbury Tales (1488). An *editio princeps* of Aristotle, published at Venice in 1483, and

richly illuminated, was sold for £800. In a recent list Mr. Bernard Quaritch offered for sale a number of early printed books, including the following: *Paalterium Latinum* (1459), on vellum, folio, the second book printed with a date, for £6250; *Biblia Latina*, the Masarin Bible, on vellum, 2 vols., folio (1450-55), the first book printed by typography, for £5000; *Caxton's Chaucer's Canterbury Tales*, folio, (1478), for £2500; and *Caxton's Dictes and Sayings* (1477), the first book printed in England with Caxton's name as the printer, for £1500. Among recent books valued as specimens of typography are some of those that issued from the Kelmescott Press of the late William Morris. Bibliomania, which flourished first in Holland (the seat likewise of the *utlipomania*) towards the end of the seventeenth century, has prevailed in England to a much greater extent than in France, Italy, or Germany. The modern bibliomania is very different from the spirit which led to the purchase of books in the middle ages at prices which appear to us enormous. External decorations, it is true, were then held in high esteem; but the main reason of the great sums then paid for books was their scarcity, and the difficulty of procuring perfect copies before the invention of the art of printing. We may mention Dibdin's *Bibliomania* or *Book-madness*; and among more modern works, John Hill Burton's *Book-Hunter*, Andrew Lang's *Books and Book-Men*, Brunet's *Bibliomania* in France and England.

BICANERE, or **BIKANER**, a protected state in India, Rajputana, bordering on the Punjab; area, 22,340 square miles. The soil is a light brown sand, and far from fertile. Water is very scarce. Almost the only agricultural products are two species of millet. The people live chiefly by pasturage, rearing camels and a good breed of horses. Coal has recently been discovered. The state, which is governed by a native prince with the title of Maharajah, was admitted to British protection in 1818. Pop. (1891), 831,210.

BICANERE, a town in India, capital of the above principality, 240 miles W. by S. from Delhi. With its battlemented walls and large citadel, both flanked with round towers, and its temples, one of which rises to a great height, it presents a magnificent appearance to the traveller approaching it through the desolate tract of country in which it stands; but a nearer inspection dispels the illusion, and the greater part of the houses are found to be hovels of mud, painted red. Water is obtained from wells. Pop. in 1901, 53,071.

BICETRE, a village of France, a little to the S.W. of Paris, with a famous hospital for old men in indigent circumstances, and an asylum for lunatics, together forming one vast establishment. This establishment was originally founded by Louis IX. as a Carthusian monastery, became later a castle, which was demolished in 1632, after being long in a ruinous state, and was restored by Louis XIII., and destined as a retreat for infirm officers and soldiers. When Louis XIV. afterwards erected the great *Hôtel Royal des Invalides*, Bicêtre became a general hospital, and it continued as such down to the Revolution, while it contained also a house of correction for swindlers, thieves, &c. The establishment was then entirely altered and converted to its present use, the buildings being partly pulled down and replaced by new ones. The poor persons admitted must be at least seventy years of age, or incapacitated from earning a livelihood by some incurable disease. The lunatics are such as belong to the department of the Seine. They are attended to with the greatest care, and fabricate neat little articles of wood and bone, known in France by the name of *Bicêtre work*. The number of beds in the institution is over 2700.

BICHAT, MARIE FRANÇOIS XAVIER, a celebrated French physician, who, during a short career, gave an

impulse to the science which he cultivated that has not yet ceased to be felt, was born at Thoirrette, in the department of Jura, Nov. 14th, 1771. His father, a physician, early initiated him into the study of medicine, which the young Bichat prosecuted at Lyons and Paris, to which latter city he withdrew from the storm which agitated the former in 1793. At Paris he studied under the direction of Desault, who treated him as a son. On the death of that distinguished surgeon (see DESAULT) Bichat superintended the publication of his surgical works, and in 1791 began to lecture upon anatomy in connection with experimental physiology and surgery. From this period, amidst the pressing calls of an extensive practice, he employed himself in preparing those works which spread his reputation through Europe and America, and which had the most beneficial influence upon medical science generally. In 1800 appeared his *Traité des Membranes*, which passed through numerous editions, and immediately after publication was translated into almost all the languages of Europe. In the same year was published his celebrated work *Recherches sur la Vie et la Mort*, which was followed the next year (1801) by his *Anatomie Générale* (four vols. 8vo.)—a complete code of anatomy, physiology, and medicine. In the twenty-eighth year of his age Bichat was appointed (1800) physician of the *Hôtel-Dieu*, in Paris, and with the energy characteristic of true genius began his labours in pathological anatomy. In a single winter he opened no less than 600 bodies. He had likewise conceived the plan of a great work upon pathology and therapeutics; and immediately upon commencing his duties as physician to the *Hôtel-Dieu* he began his researches in therapeutics by experiments upon the effects of simple medicines. In the midst of his activity and usefulness he was cut off, July 22, 1802, by a malignant fever, probably the consequence of his numerous dissections. His friend and physician, Corvisart, wrote to Napoleon in these words: 'Bichat has just fallen upon a field of battle which counts more than one victim: no one has done so much, or done it so well, in so short a time'. Bichat was the creator of general anatomy, or of the doctrine of the identity of the tissues of the different organs, which is the fundamental principle of modern medicine. His *Anatomie Générale* was translated into English by Dr. G. Hayward, and published in three vols. 8vo.

BICKERSTAFFE, ISAAC, a well-known dramatic writer of the eighteenth century, was born in Ireland about 1735. He wrote many successful pieces for the stage, some of which, such as the operas of *Love in a Village* and *The Padlock*, are still represented. His celebrated comedy of *The Hypocrite*, adapted from Colley Cibber's *Nonjuror*, which was again borrowed in its leading incidents from Molière, long retained its place on the stage, with its well-known characters of Mawworm and Dr. Cantwell. The music of many of Bickerstaffe's pieces was composed by Charles Dibdin. Latterly he retired to the Continent, and died there in obscurity about the year 1812.

BICKERSTETH, REV. EDWARD, an active and devoted clergyman of the Church of England, was the son of a surgeon in Kirkby-Lonsdale, Westmoreland, and was born there on 19th March, 1786. He was educated in the grammar-school of his native town, and at the age of fourteen was placed in a situation in the post-office, London. After remaining there for six years he served an apprenticeship of five years as an articled clerk with Mr. Bleasdale, a London attorney. He then commenced business as a solicitor in Norwich, in partnership with his brother-in-law, Mr. Bignold (having married in 1812)—an undertaking which rapidly prospered, and from which he soon

found himself realizing a large and increasing income. A great change however now came over his mind—the truths of religion made a deep impression on him, and he began to exert himself in promoting their diffusion among his fellow-men. Among other works accomplished by him was the establishment of the Norwich Church Missionary Society. He also published in 1814 *A Help to the Study of the Scriptures*, which met with great success. But nothing could now satisfy him till he had fairly embarked all his energies in the cause of religion, and he accordingly resolved to abandon the legal profession for that of a minister of the Church of England. The Church Missionary Society wished to send him abroad on a special mission to Africa, and in this view the Bishop of Norwich, dispensing with the usual course of a university education, admitted him to deacon's orders on 10th December, 1815, and a fortnight afterwards he was admitted to full orders by the Bishop of Gloucester. Mr. Bickersteth thereupon with his wife proceeded to Africa, from which, after accomplishing satisfactorily the objects of his mission, he returned in the following autumn. He now filled the office of secretary to the Church Missionary Society, and from this period to 1830, when he resigned it, was most zealous and indefatigable in the performance of its multifarious duties. In the year last mentioned he became rector of Watton in Hertfordshire, and spent there the remainder of his life. By this time Mr. Bickersteth was widely known throughout the kingdom as one of the most influential and popular clergymen of the evangelical section of the church. Besides taking a constant and active share in furthering the cause of the various religious societies, including the Evangelical Alliance, of which he was one of the founders, he likewise issued from the press a series of publications which had an immense circulation. These include among others *The Christian Student*, *A Treatise on the Lord's Supper*, *A Treatise on Prayer*, *The Signs of the Times*, *The Promised Glory of the Church of Christ*, *The Restoration of the Jews*, *A Practical Guide to the Prophecies*, besides sermons and tracts without number. In 1846, while proceeding to a meeting of the Evangelical Alliance, he sustained a terrible accident by being thrown from his chaise and run over by a cart, but he lived till 24th February, 1850.

BICYCLE. See **CYCLE**, in **SUPR.**

BIDASSOA, or **VIDASSOA** (Basque, 'way to the west,' or 'two streams'), a river, Spain, about 45 miles long, the last 12 of which form the boundary between France and Spain. It rises in the mountains of Spanish Navarre, and, after various changes of direction, falls into the Bay of Biscay near Fontarabia. In former times Spain claimed not only the entire river, but so much of its banks, on the French side, as its waters covered at full tide. This difference was finally settled by each country contenting itself with its own shore. Near Iruia there is a small island in the middle of the stream, called the Island of Pheasants, on which, being a sort of neutral ground, Louis XI. and Henry IV. met in 1463. Here also a peace was concluded between France and Spain in 1654; and here again in 1660 Cardinal Mazarin met Louis de Haro, and arranged the marriage between the daughter of Philip IV. and Louis XIV.

BIDEFORD, a town, United States, Maine, on the Saco, close to the falls, and about 6 miles above its mouth, on the Portland, Saco, and Portsmouth Railway, 12 miles s.w. Portland. It possesses several churches, an academy, and other excellent schools, a large iron foundry, numerous cotton, flour, and saw mills, and carries on an extensive trade, particularly in lumber. The falls, though furnishing

valuable water-power, seriously obstruct the navigation of the river, and thus limit the foreign trade. As Saco lies immediately opposite on the river, the two towns may be considered as one. The pop. in 1870 was 10,229; in 1890, 14,443.

BIDDLE, JOHN, a celebrated Socinian writer, was born in 1615, at Wotton-under-Edge, in Gloucestershire. He entered Magdalen College, Oxford, in his nineteenth year. He graduated as A.M. in 1641. Being led to doubt of the doctrine of the Trinity, he drew up twelve arguments on the subject; in consequence of which he was committed to jail by the parliamentary committee then sitting at Gloucester, but was liberated on security being given for his appearance when called for. About six months afterwards he was examined before a committee of Parliament, to whom he readily acknowledged his opinion against the divinity of the Holy Ghost. His Twelve Arguments were now ordered to be burned by the common hangman. He however persisted in his opinion, and in 1648 published two tracts, containing his Confession of Faith concerning the Holy Trinity, and The Testimonies of Irenaeus, Justin Martyr, and several other early writers on the same subject. These publications induced the Assembly of Divines to solicit Parliament to decree the punishment of death against those who should impugn the established opinions respecting the Trinity and other doctrinal points, as well as to enact severe penalties for minor deviations. The Parliament indulged these ministers in their intolerant request, which immediately exposed Biddle, who would neither consent nor recant, to the loss of life; but difference of opinion in the Parliament itself, and the penalties to which this sweeping measure rendered many in the army liable, prevented its execution. He was some time after again remanded to prison, by the zeal of President Bradshaw, and remained for some years in confinement, subjected to the greatest privations. A general act of oblivion in 1651 restored him to liberty, when he immediately disseminated his opinions both by preaching and by the publication of his Twofold Scripture Catechism. A complaint being made to Cromwell's Parliament against the book, he was confined in the Gate House for six months. Cromwell banished him to St Mary's Castle, Scilly, where he assigned him an annual subsistence of a hundred crowns. Here he remained three years, until the Protector liberated him in 1658. He then became pastor of an Independent congregation, and continued to support his opinions, until fear of the Presbyterian Parliament of Richard Cromwell induced him to retire into the country. On the dissolution of that Parliament he preached as before until the Restoration, after which he was obliged to confine himself to private preaching. In June, 1660, he was apprehended at one of the private assemblies, and upon process of law fined £100, and ordered to lie in prison until it was paid. He fell a victim to this sentence, by catching one of the distempers so common at that time in jails, and died in September of this year, in the forty-seventh year of his age, a martyr to religious intolerance. The private character of this courageous sectarian, like that of most of those who suffer from principle, was moral, benevolent, and exemplary; and his learning and logical acuteness rendered him very fit to gain proselytes. He did not agree in all points with Socinus, but was apparently unsolicitous to establish a perfect agreement. Toulmin styles him the *father of the modern Unitarians*.

BIDEFORD, a market town and munic. bor., England, county Devon, 44 miles N. of Plymouth, picturesquely situated on both sides of the Torridge,

4 miles from the sea, the principal portion being on the w. side, on a bold acclivity. A handsome stone bridge of twenty-four arches, and 677 feet in length, connects the two divisions of the town, being one of the finest bridges in the west of England. Near the centre of the town is a spacious market-place. The principal public divic building is the town-hall, a neat edifice in the Elizabethan style. Public rooms have also been erected, containing a fine large music-hall. The Bridge Hall contains a free library, a reading-room, and a science and art school; its style is French Renaissance. The present Royal Hotel represents an older building, dating from the Revolution; and parts of the earlier structure are incorporated in the present one. The most important church is that of St. Mary, in Perpendicular style, which was all rebuilt, except the tower, in 1865. The chief industries comprise the making of coarse earthenware, collars and cuffs, tanning, malting, iron-founding, &c. In former times Bideford had an extensive shipping trade, and is said to have imported more tobacco in some years than the metropolis. The shipping trade now is not of much importance. Pop. in 1871, 6969; in 1881, 6512; in 1891, 7831; in 1901, 8754.

BIDPAI. See **PILPAI**.

BIEBRICH, a town of Prussia, on the Rhine, 3 miles s. of Wiesbaden. It has a fine castle dating from the end of the seventeenth century, where the dukes of Nassau formerly resided. There are manufactures of cement, artificial manures, soap, and various other industries. Pop. (1895), 12,292.

BIELA. See **BIENNE**.

BIELA, **WILHELM VON**, Austrian officer and astronomer, was born at Rosalia in 1782, and died at Venice in 1856. On Feb. 27th, 1826, he discovered at Josephstadt, Bohemia, a new comet which, a few days later, was sighted by Gambart from Marseilles. Both noticed its similarity to comets appearing in 1772 and 1806, and fixed its period at between six and seven years; but it was named after Biela, who had first discovered it. Shortly after its reappearance at the end of 1845 it was seen to divide into two portions, each of which afterwards developed a tail and a brilliant nucleus, features wanting in the original body. In August, 1852, the double comet reappeared, but this time the two portions were much farther apart; and not long after the comet vanished, and has never been sighted since.

BIELEF, or **BELEY**, a town of Russia, in the government of Tula (62 miles s.w. of the capital of that name), situated on the left bank of the Oka. It has manufactures of soap, leather, and hardware, and a considerable trade. Pop. (1892), 9920.

BIELFELD, a town of Prussia, in the province of Westphalia, at the northern foot of the Teutoburger-Wald, 38 miles n. from Munster. The river Lutter divides it into an old and a new town. The best German linens are manufactured here, flax-spinning and bleaching are largely carried on, and there are various other industries, among which some of the chief are shirt-making, silk-weaving, the manufacture of cycles and sewing machines, and of cigars, glass, cement, leather, &c. Pop. (1895), 47,458.

BIEGOROD, a town, Russia, government of, and 76 miles s. from the town of Kursk, on the Donetz, consists of an old and new town with suburbs. The houses are nearly all of wood. It is the seat of an archbishop's see, and has three important fairs, each lasting for a week. Its name, which in Russian signifies 'white town', is derived from a chalk hill in the vicinity. The environs are noted for producing fine fruits. Pop. (1892), 24,869.

BIELITZ, a town, Austrian Silesia, in the government of Brünn, 42 miles w.s.w. of Cracow, on the left bank of the Biala, which divides Silesia from Galicia.

A stone bridge connects it with the town of Biala in Galicia. It has extensive manufactures of woollens, flax and jute yarn, dyeworks and printfields, and a trade in cloth, wine, salt, &c. Pop. (1890), 14,578.

BIELLA, a town of Italy, in Piedmont, in the province of Novara, 36 miles n.n.e. of Turin, on the Cerno. It is the seat of a bishop, and contains a cathedral, two hospitals, and a college. Pop. 12,000.

BIELO-OZERO ('white lake'), a lake of European Russia, in the government of Novgorod, whose outflow is carried by the Chekana river to the Volga. It is of a somewhat circular form, and has an area of about 480 square miles. A system of canals connects it with the Dwina and other rivers, and fishing is carried on in it.

BIENNE, or **BIEL**, a town, Switzerland, canton of Bern, 16 miles n.w. of the capital, beautifully situated at the n. end of the lake of same name, and at the foot of the Jura. It is approached by several planted avenues, and surrounded by ancient walls, with watch-towers at intervals. From its position at the intersection of several main roads it has a considerable transit trade. There are also manufactures of watches, cigars, cotton, nails, &c. Pop. (1888), 15,414.—The **LAKE OF BIENNE**, called in German *Bielsee*, is about 10 miles long by 3 broad, and has a depth of 80 fathoms. Its scenery is more beautiful than bold. Being 2 feet below the level of Lake Neuchâtel, it receives its waters by the Thiel and discharges itself into the Aar. On the islet of St. Pierre, in this lake, J. J. Rousseau resided for two months in 1765. That the lake was a centre of population from remote times the remains of numerous pile-dwellings prove.

BIENNIALS, in botany, are plants which do not produce flowers and fruit during the first year of growth, but store up a stock of nourishment in a thickened stem or root, whence they draw the material for the growth of the second year, during which flowers and fruits are developed and the plant dies. Several of our commonest food-plants, such as turnip, cabbage, and carrot, are biennials. Under special circumstances, favourable to rapid growth, a plant, ordinarily biennial, may become an annual.

BIÈVRE, **N.**, **MARÉCHAL**, **MARQUIS DE**, born 1747, served in the corps of the French musketeers, was a life-guard of the King of France, and acquired much reputation by his puns and repartees. After publishing several entertaining works, he composed (1783) *Le Séducteur*, a comedy in verse, for the theatre, which has maintained its place on the stage, although it is bad both in plan and execution. When he was introduced to Louis XV., the king wished to hear a *calembour* (pun) of his. *Donnez-moi un sujet, sire* (Give me a subject, sire), said Bièvre.—*Faites-en un sur moi* (Make one on myself).—*Sire, le roi n'est pas un sujet* (Sire, the king is not a subject), was the answer. In 1789 he went to Spa for the benefit of his health, and died there. *Mes amis*, he said, dying, *je m'en vais de ce pas (de Spa)*.

BIG. See **BARLEY**.

BIGAMY, in the canon law, means being twice married; in the common acceptance of the word, as a term of ordinary law, it means the being married to two wives or husbands at the same time. The laws relating to plurality of wives or husbands might be supposed to come strictly under the head of *polygamy*; but, as it constitutes an offence against these laws to have more than one husband or wife, they are usually brought under that of *bigamy*. The laws of every civilized society make some provision respecting this subject. By the statute of 4 Edward I. stat. 3, cap. 5, the marrying of a second husband or wife, the first being alive, was made felony; and by that of 2 James I. cap. 11 this crime was made punishable by death. But the same statute provided that, where

either party was absent beyond seas for seven years, whether known or not known to the other party to be alive, or was absent, though not beyond seas, for the same period, and not known by the other party to be alive, the other party was at liberty to marry again. Now, however, one of the parties is not held guiltless unless the other was absent continuously for seven years, and was not known to be alive. The penalty has been lessened by subsequent enactments, and the guilty party is now liable to penal servitude for seven years, or not less than five; or to be imprisoned with or without hard labour for not more than two. Every person aiding or abetting the bigamist is held to be equally guilty, and may receive the same punishment. By a Scottish statute of 1551 bigamy was made punishable as perjury—that is, with confiscation of goods, imprisonment, and infamy; now, imprisonment is the usual sentence, but in some cases penal servitude is inflicted. If the accused had reasonable ground for believing the first spouse dead, he is not guilty of the crime; and if the first marriage was void for any reason, or dissolved by divorce, the second is not bigamous. In Scotch law, too, it is not necessary that either marriage should be regular for bigamy to be committed. The statute of James I. has been adopted in most of the United States as to the description of the crime; but the American laws generally differ from it as to the penalty, having assigned, heretofore, instead of death, as provided by the English statute, the punishment of whipping, setting the culprit on the gallows, &c.; but most, if not all of the United States, have now dispensed with these corporal inflictions, some of them prescribing imprisonment and hard labour for a number of years, according to the discretion of the court; others leaving it to the verdict of the jury to fix the period of imprisonment.

BIGGAR, a village in the Upper Ward of Lanarkshire, Scotland, 25 miles s.w. Edinburgh, on a branch of the Caledonian Railway, and on both sides of the Biggar Water. It consists chiefly of one principal street, straight, spacious, and well built. The principal building is the church, which is cruciform, with a tower in the middle. Biggar became a burgh of barony in 1451, and a police burgh in 1863. The ancestors of Mr. W. E. Gladstone belonged to this quarter. Pop. in 1891, 1366; in 1901, 1366.

BIGGLESWADE, a market town in England, county Bedford. The town is well built and pleasantly situated on the right bank of the Ivel, here crossed by two stone bridges, 10 miles s.e. Bedford. It has an Early English church of St. Andrew, containing a piscina, sedilia, and other interesting relics. The chief of the other buildings is the town-hall, a substantial structure in Roman-Doric style. There is a small hospital for contagious diseases. The preparation of vegetables, especially onions, for pickling affords employment to a considerable portion of the female population. Cycles are manufactured, and near the town there are many market gardens. The Great Northern Railway has a station here. Biggleswade gives name to one of the parliamentary divisions of Bedfordshire. Pop. (1901), 5120.

BIGNONIA, a genus of trees and shrubs belonging to the natural order Bignoniaceæ, inhabiting tropical America. They have opposite, pinnate, or ternate leaves, and panicles of white, yellow, blue, or red flowers, with an irregularly campanulate corolla. They are very beautiful plants, and several species, some of them climbing, are cultivated in Europe as ornamental plants. The branches of *B. kerrie* are used in South America for making baskets, and from the leaves of *B. chioa* a red colouring matter called *chiaa* is obtained. The wood of some species, especially *B. leucoxydon*, is much prized by cabinet-makers.

BIHACS, or **BIMATCH**, a fortress of Bosnia, on an island of the Unna, about 50 miles s. of the Adriatic. It has a low and unhealthy site, but is remarkable for its strength. The possession of it has often been keenly contested during the Turkish wars. Pop. 4500.

BIJANAGUR, or **VIJAYANAGARA**, otherwise **HAMI**, an ancient and celebrated city of Hindustan, now in ruins, in Bellary district, Madras, 30 miles n.w. of Bellary. It stands in a plain, surrounded by enormous masses of granite, and covers an area nearly 8 miles in circuit. On the n. and w. it is washed by the Tungabhadra, and in other directions is inclosed partly by natural precipices and partly by strong stone walls. Among its edifices are a magnificent temple of Vishnu, with a pyramidal portico about 160 feet high, divided into ten stories; another temple, also entered through a painted pyramidal portico; and one of Rama, with pillars of black hornblende covered over with elaborate mythological sculptures. These buildings, and many others besides, are in the purest style of Hindu architecture. Its ruin was effected by a confederation of Mohammedan rajahs, who took and sacked it in 1564.

BIJAPUR. See **BEJAPOOR**.

BIJNAUR, a district in the Rohilkand division of the North-west Provinces, India, lying s. of Meerut. Sugar is the staple of the district, which has an area of 1898 square miles, and a population of 794,070. The capital, Bijnaur, stands about 3 miles s. of the Ganges, and is a neat town, with a trade in sugar, and manufactures of thread, cotton cloth, and knives. Pop. (1891), 16,236.

BIKANER. See **BICANERE**.

BILBAO, a city in Spain, capital of the province of Biscay or Bilbao, is situated on the navigable Nervion, in a plain surrounded with high mountains, a few miles from the sea. The river is crossed by four bridges. The town is picturesque, and well built, and contains several good churches, two fine promenades, a theatre, a marine school, &c. Bilbao carries on an important trade and manufactures (the latter consisting chiefly of sailcloth, ropes, and leather), and possesses large shipyards and iron-foundries, iron and steel works, &c. It is one of the most flourishing seaports of Spain, though its accommodation for shipping is defective. Various harbour improvements, however, have recently been carried out, including a breakwater and mole. Bilbao exports much iron ore (especially to the United Kingdom), also pig-iron, wool, wine, &c.; the imports are manufactured and colonial goods, dried fish, timber, coal, &c. Its supply of water and sanitary arrangements are not good. Pop. (1896), 66,205.

BILBERRY. See **WHORTLEBERRY**.

BILDERDYK, **WILLIAM**, an eminent Dutch poet, was born at Amsterdam, 1756. He studied at Leyden, and in 1776 obtained from the learned society of Leyden the first prize for a poem on the influence of poetry upon governments. In 1780 he obtained another prize for a poem on the connection of poetry and eloquence with philosophy. Bilderdijk, besides, devoted himself to law, at the Hague, with great success. On the invasion of the Netherlands by the French he left his country and removed to Brunswick, where he studied the German language and poetry, and afterwards to London, where he delivered, in the French language, lectures on literature and poetry. After the new order of things was firmly established in Holland he returned in 1799, and soon afterwards published some of his principal works. Among these are a didactic poem on astronomy, and the masterly imitations of Delille's *L'Homme des Champs*, and Pope's *Essay on Man*. Louis Bonaparte, on his accession to the throne, appointed him his

teacher of Dutch, and one of the first members of the national institute founded by him. Bilderdyk produced a number of war-songs, which are considered to be among the best in Dutch poetry. He died in Dec., 1831, at Haarlem.

BILE, a fluid secreted by the liver, and contained in the larger hepatic ducts, and in the gall-bladder, a special receptacle for it. (See LIVER, GALL-BLADDER.) Though tolerably alike in all animals, it varies both as to the substances it contains and their amount. In man it contains about 80 per cent of water and 14 per cent solid matter, and has a colour varying from yellow or yellowish green to yellowish or reddish brown; when fresh it has a not unpleasant odour of musk, and a very bitter taste. Sometimes it is clear and limpid, at others it is muddy, from the separation of mucus. When the mucus remains in it, it very soon putrefies, but if precipitated and removed, the bile can be preserved for a considerable time. Fresh bile is neutral or slightly alkaline; after decomposition it is alkaline, and then inorganic salts begin to precipitate in it. In the bile of animals a large number of substances have been isolated and identified. The most important are: the organic so-called bile salts (salts of soda); colouring matters, of which several have been described, especially bilirubin and biliverdin; cholesterol, fats, fatty acids combined with alkalies; inorganic salts, consisting of chlorides (especially chloride of sodium), carbonates and phosphates, with traces of iron, manganese, &c. These substances are all held in solution by water, the proportion of which varies in the bile of different animals from 80 to 95 per cent. Besides these, which exist normally in bile, there are many other substances which are present in different diseases. The concretions called biliary calculi or gall-stones vary a good deal in composition. Some are crystalline, but most are soap-like. They consist of cholesterol, and are generally of a light colour. When the gall-stone is very dark it contains biliary colouring matter. The most curious animal gall-stones are the *bezours* (which see) of the antelope. (See also CALCULUS.)

The bile partly aids in the process of digestion, but it also contains ingredients which are separated from the blood and are conveyed out of the body as waste and injurious matter. It is most largely secreted after meals, and about 2½ lbs. of it may be poured into the small intestine in twenty-four hours. It exercises an influence on fat, with which it forms an emulsion, and thereby facilitates its absorption and diffusion. It also stimulates the action of the intestines, and has an antiseptic influence on the contents of the bowels.

BILBUJ-GERID, or **BELBUJ-JERID**, a name given by the Arabs to a part of Africa south of Tunis, but sometimes extended by Europeans to the large date-producing country between Fezzan and Morocco.

BILIN, a town and health resort in Bohemia, 7 miles S.W. Teplitz. It contains a fine old castle built in 1680, and one of more modern date; several churches, chapels, mills, &c. Within one mile of the town are much-frequented mineral springs, from which much water is exported. The salts and magnesia obtained from the water form important articles of commerce. It is an alkaline water, and is used with advantage in certain concretionary disorders. Here is also the singular basaltic rock called Biliner Stein. The population in 1890 was 6661.

BILL, an instrument of war and labour.—(1) A short axe or hatchet, with a hooked point, formerly used by foot-soldiers. A common battle-cry with the English was 'Bills and bows!' (2) An iron instrument with a curved head and wooden handle used in gardening and other trades.

BILL, a written or printed paper containing a statement of some particulars. In common use a tradesman's account, a printed proclamation or advertisement, is thus called a bill. In Parliament a bill is a draft of a proposed statute submitted to either house for approval. When the bill has passed the two houses, and received the royal assent, it becomes an act. (See PARLIAMENT.) In law a bill is in England a declaration in writing to a court of law, expressing some complaint of the violation of a law by which the complainant has received injury; in Scotland it is a summary application by petition to the Court of Session. Below will be found an account of some of the most important terms or expressions in which the word bill is employed.

BILL OF ATTAINDER and of **PAINS AND PENALTIES** were forms of procedure in Parliament which were often resorted to in times of political agitation. An attainder in common law signified the *corruption of blood* of a criminal capitally condemned for treason or felony, included forfeiture of goods, and took away from descendants the right of succession. Pains and penalties is a general term, which derived its significance from the particular pains and penalties imposed in the bill. Bills of attainder and of pains and penalties were promoted by the crown, or the dominant party in Parliament when any individual obnoxious to them could not readily be reached by the ordinary forms of procedure. Parliament being the highest court of the kingdom could dispense with the ordinary laws of evidence, and even, if actuated by passion or servilely devoted to the authorities, condemn the accused in the most arbitrary manner. Hence the convenience of this form of procedure. It was common, however, to allow the accused to be heard at the bar of the house, but under Henry VIII., when the abuse of this power reached its highest point, even this privilege was denied. During this reign many persons of distinction were brought to the scaffold by means of bills of attainder, for denying the royal supremacy and other offences. After Henry VIII. this mode of procedure was comparatively little used.

BILL OF COSTS is an account rendered by an attorney or solicitor of his charges and disbursements in an action, or in the conduct of his client's business.

BILL OF ENTRY and **BILL OF SIGHT** are custom-house forms required to be observed by merchants in shipping or landing goods. A bill of entry gives the necessary particulars of the goods; a bill of sight is an application to have the goods examined in presence of an officer, in the event of the merchant not being able to give the particulars.

BILL OF EXCHEQUER. See EXCHEQUER.

BILL OF MORTALITY. See MORTALITY.

BILL OF DECLARATION OF RIGHTS. A declaration, afterwards embodied in a bill, called the Declaration and the Bill of Rights, constituted the convention by which the Prince and Princess of Orange were called to the throne of England in 1689, and are the basis of the conditions on which the crown of England is still held. When Parliament met to consider on what terms the crown forfeited by James should be conferred on William and Mary, 'the great majority of the Commons', according to Hallam, 'wisely resolved to go at once to the root of the nation's grievances, and show their new sovereign that he was raised to the throne for the sake of those liberties by violating which his predecessor had forfeited it'.

The Declaration first recited the illegal acts of King James; secondly, declared these acts to be illegal; and thirdly, declared that the throne should be filled by the Prince and Princess of Orange in

accordance with the limitations of the prerogative thus prescribed.

It contains the following specific declarations:—That the pretended power of suspending laws and the execution of laws, by regal authority without consent of Parliament, is illegal; That the commission for creating the late courts of commissioners for ecclesiastical causes, and all other commissions or courts of the like nature, are illegal and pernicious; That levying of money for or to the use of the crown by pretence of prerogative without grant of Parliament, for longer time, or in any other manner than the same is or shall be granted, is illegal; That it is the right of the subjects to petition the king, and that all commitments or prosecutions for such petitions are illegal; That the raising or keeping a standing army within the kingdom in time of peace, unless it be with consent of Parliament, is illegal; That the subjects which are Protestants may have arms for their defence suitable to their condition, and as allowed by law; That elections of members of Parliament ought to be free; That the freedom of speech or debates on proceedings in Parliament ought not to be impeached or questioned in any court or place out of Parliament; That excessive bail ought not to be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted; That juries ought to be duly empanelled and returned, and that juries which pass upon men in trials of high treason ought to be freeholders; That all grants and promises of fines and forfeitures of particular persons, before conviction, are illegal and void; And that, for redress of all grievances, and for the amending, strengthening, and preserving of the laws, parliaments ought to be held frequently.

The Bill of Rights, passed in 1689, confirmed these declarations, settled the crown upon Protestants, and declared that any king or queen of England who should marry a Roman Catholic would be incapable of reigning in England, and the subjects absolved from allegiance. It also rendered more stringent the clause in the declaration asserting the illegality of the power assumed by the kings of dispensing with the laws.

BILL OF EXCHANGE (including *promissory notes* and *inland bills* or *acceptances*). A bill of exchange is a species of mercantile currency generally accepted by trading nations. As having such a character bills of exchange are protected and regulated by the laws of those nations, which in turn are based upon and have arisen from the customs of the trading communities to which they owe their origin. The earliest record of the existence of bills of exchange dates from 1328 A.D., but it was not until the following century that they are said to have come into general use.

The whole of the law relating to bills of exchange, promissory notes, and cheques is codified in the Bills of Exchange Act, 1882 (45 and 46 Vict. cap. lxi.), which embraces all the existing law on these instruments with but a few modifications. The act defines 'a bill of exchange' as 'an unconditional order in writing or printing addressed by one person (called the drawer) to another (the drawee), signed by the person giving it (the drawer), requiring the person to whom the instrument is addressed (the drawee) to pay on demand or at a fixed or determinable future time a sum certain in money to, or to the order of, a specified person (the payee) or to bearer.' This instrument is completed by what is termed 'acceptance', effected by writing across its face 'Accepted,' and J. B. (the drawee) thereupon becomes known as the 'acceptor'.

Bills of exchange are divided into two classes—in-

land and foreign bills. We shall first set forth the ordinary forms of these, and also that of a promissory note, and then proceed to consider the three documents and explain their nature, together with some of the chief legal principles governing their use. The act defines a promissory note to be 'an unconditional promise in writing by one person to another, signed by the maker, engaging to pay on demand or at a fixed or determinable future time a sum certain in money to, or to the order of, a specified person or bearer'.

(1) *Inland Bill or Acceptance.*

London, 1st May, 1902.

£100:0:0.

Three months after date pay A. B. (payee) (or 'to my order') the sum of One Hundred Pounds sterling, for value received.

(Signed) J. B. (drawer),
of 10 Cannon St., A.C.

To M. N. & Co. (drawees),
1 St. Mary Street, Cardiff.

Across the face of this we may suppose to be written: 'Accepted, payable at the National Bank of Wales, Cardiff.'
(Signed) M. N. & Co. (acceptors).

The following points in the form here set forth have been held not essential, and therefore do not affect the *validity* and *operation* of the bill:—(1) Place and date of making (unless the latter is required to fix the time of payment). (2) Place of payment. (3) Words 'value received' or 'to order'. (4) The addresses of the drawer or the drawee. (5) The words 'Accepted, payable at the National Bank of Wales, Cardiff'. The signature alone of the drawee across the face of the document is sufficient to constitute a valid acceptance. (6) The bill is not invalid because it does not specify the value given, or that any value has been given for it. It has also been laid down in the act that unless the contrary appears on the face of a bill, the holder is entitled to treat it as an 'inland' one.

(2) *Foreign Bill of Exchange.*

Monte Video, May 1st, 1902.

£100:0:0.

At sixty days' sight of this *first* of exchange (second and third of same tenor and date unpaid) pay to the order of W. S. the sum of One Hundred Pounds sterling, value as advised [or 'which charge to our account' or 'to account of — as advised'.]

(Signed) F. & Co.

To F. B. & Co., Liverpool.

This bill being drawn on a firm in the United Kingdom, the amount is made payable in British money. But if, on the other hand, it had been drawn in London and made payable to the order of a foreign firm at their place of business abroad, the amount payable would be stated in the currency of that place. It is common, in the case of these foreign bills of exchange, for the drawer to draw and deliver to the payee the bill in a set of three, each signed by the drawer, numbered, and referring to the other two. The whole set constitutes one bill, and where any one part is discharged the whole bill is discharged, subject to certain exceptions. The acceptance must be written, *together with the date of presentment for acceptance*, across the face of one of the parts, and this part alone becomes and is negotiable, i.e. the instrument is, like cash, transferable by mere delivery. If the bill is drawn in one part, the form of expression then used is 'this *sole* of exchange'.

(3) *Promissory Note.*

Liverpool, May 1st, 1902.

£100:0:0.

Three months after date I promise to pay G. M. or order (or to the order of G. M.) the sum of One Hundred Pounds sterling, value received.

(Signed) W. B.

The first and third forms are, in effect, nearly equivalent, and are in most common use, but, if the third form is a promise to pay to the maker's own order, it becomes a promissory note only when indorsed by the maker. An instrument drawn according to the first form, but without a drawee, and accepted by the drawer is treated as a promissory note.

The important and peculiar characteristic of these bills and notes is their possession of the quality of negotiability. These *negotiable instruments*, as they are therefore termed, entitle the person named in the document or the person to whom, after he has indorsed it, the indorser has transferred its ownership, or even the bearer where it is so stated in the instrument, to a sum of money. The instrument itself is to be regarded as representing money, and as such its ownership becomes transferable by mere delivery. Bills and notes (and also cheques) have derived their character of being thus negotiable from the custom and convenience of the merchants of the Middle Ages. And, until quite recently, the custom of merchants and a statute expressly conferring negotiability upon a particular instrument were the only tests of negotiability in English law. Recent decisions of the courts, however, have tended to establish a new test, viz. *modern usage* and the convenience of merchants and business, in addition to the two already mentioned. The following rule may now be said to be established—that the universal usage of the monetary world, though of recent origin, is sufficient to make an instrument negotiable. Accordingly it was held in 1898 that where a mercantile usage to treat as negotiable the *debentures* of an English company has been proved, the court will give effect to such usage in spite of its being of recent origin only.

It may be that a foreign instrument, negotiable according to the law of the country in which it is issued, is not negotiable in the United Kingdom. It is not enough to prove that such instrument forms a part of the mercantile currency of a given foreign country, but it must also be shown that it is negotiable in this country by the custom of British merchants.

Another important matter dealt with in the act has received judicial exposition in a well-known case, namely that of *Vagliano Brothers v. The Bank of England*. The third subsection of section seven of the act lays down that where the payee mentioned in the bill is a non-existent or fictitious person, the instrument may be regarded as one payable to bearer, and consequently the drawer and the other parties to it become liable to any person who takes the bill for value and honesty without any knowledge or notice of any defect in the right to it of the person who transferred it to him. In this important case, it was decided that if the name of a real person is made use of by a forger as that of the payee, and that person has not, and is never intended to have, anything to do with the bill, even though the acceptor is induced to accept by the belief that the person named as payee has actually drawn the bill, yet the bill is to be regarded as payable to bearer with the result mentioned above. Upon the same principle, it was held still more recently, that when a cheque, drawn payable to a fictitious or non-existent person, has been delivered by the drawer to be used as a cheque, it becomes payable to bearer, and the drawer becomes liable upon it to any person coming honestly by it, and without knowledge of any defect in it. It does not matter that at the time the drawer signed the cheque he was not aware that the payee was a fictitious or non-existent person.

Any bill when accepted is a completed acknow-

ledgment of debt, and fixes a precise time for its payment. The convenience of such a form of acknowledgment in mercantile affairs is so great that this form is protected by the laws of all mercantile communities by special privileges. In general the holder of a bill can proceed against the drawer or acceptor in a summary manner without the common forms of an action at law, the bill being considered by all law-courts as containing proof in itself of an uncancelled obligation. As soon as a merchant or trader fails to pay his bills when due the fact is made public, and he is virtually considered and treated as bankrupt. The holder of the bill by proceeding against him can also compel him to pay or take refuge in legal bankruptcy. On account of the stringency with which the payment of bills was and is still demanded, they originally, by the custom of merchants, obtained the quality of negotiability already described, or in other words became a kind of currency, and as such negotiable by delivery from hand to hand. There are two ways in which a bill may be negotiated. It may be paid to some one to whom the holder is indebted, or it may be transferred to some one who gives an equivalent for it in goods or cash. The former is comparatively a feeble test of negotiability, and a bill is not said to be negotiable in the strict sense unless actual value can be obtained for it. A bill is said to be negotiated privately when it is transferred in this way by one merchant to another; publicly, when it is offered for sale in open market, or transferred to a public banker or bill-broker. When the first holder of a bill, that is, the person in whose favour it is drawn, who is also called the payee, parts with it in any of these ways, he indorses it, that is, writes his name across the back of it, which form constitutes him an indorser of the bill, and renders him liable for it to any subsequent holder in the event of the failure of the acceptor, or drawee, to pay it. He may, however, escape this liability, at the expense of rendering the bill less negotiable, by writing before his signature the words 'without recourse'. The practice of indorsing bills without recourse is very common in America, very rare in Great Britain; an accurate indication of a difference in the tone of mercantile transactions between the two countries which is very widely prevalent. The security of the subsequent holders of a bill is thus increased by each unqualified indorsement. The last phase in the negotiation of a bill is usually its being discounted with a banker. The merchant may either discount it with a bill-broker, who re-discounts it with the banker, or he may take it direct to the banker. The broker or banker deducts (as do also the previous negotiators of a bill) a discount, or equivalent for the use of the money he pays until the due date of the bill, when he expects it will be repaid him. The rate of this charge depends upon the length of time the bill has to run and its value as a security. A bill of which the security is undoubted is called a *first-class bill*. There is usually a current rate of discount for first-class bills, which is determined in Great Britain by the rates of the Bank of England, which differ for long or short bills, a long bill being usually considered one which has more than three months to run. The great majority, both of foreign and inland bills, are now discounted at once by the payee with a broker or banker. It is not, however, unfrequent for either to pass through several hands, and sometimes small bills of exchange drawn on the Continent pass through many hands before they are presented for acceptance. Bankers discount bills as a profitable investment for their money, and do not usually re-discount them, but wait their due date for payment. Instances, however, are not wanting in which

bankers, having exceeded their available resources, have re-discounted their bills on a large scale.

Bills of exchange present a very convenient mode of transferring funds between distant markets. A., for example, in Calcutta receives goods from a correspondent in Manchester, or wishes to send money to a correspondent there to buy goods for him. B. is shipping produce from Calcutta to London. B. sells to A. a bill upon his London correspondent, and A. remits it to Manchester in payment of his goods. Thus B. at once receives payment of his produce, and A. is enabled to remit the price of his goods without taking the risk of shipping produce on his own account. A bill of exchange is thus negotiable previous to acceptance, which is not commonly the case with inland bills, and in the event of the bill not being accepted, the holder may have immediate recourse against the drawer or indorser, not only for the amount of the bill, but for any expense or loss incurred through its non-acceptance. Notice of this dishonour by non-acceptance must, except in a few specified cases, be given the drawer and each indorser, otherwise such will be discharged from all liability. The notice may be given either in writing or by word of mouth. A bill of exchange may be drawn on one country and remitted to another. It may be sold in the market where it is drawn, or remitted by the drawer in payment of a foreign debt. Thus a merchant in Calcutta may draw a bill on a merchant in Paris, and sell it to another Calcutta merchant who may remit it to a correspondent in London, or he may himself remit it to America or Australia in payment of some debt due by him there. The sale of bills of exchange has become in many markets a separate branch of banking. The way in which it is conducted is this:—A banker or exchange-broker, say in New York, buys the bills of merchants on London or Liverpool, and remits them to a correspondent in London who collects them. According to the amount of bills which he has purchased, he sells his own bills on the same correspondent, and as the bills of a banker or exchange-broker usually sell more favourably than those of a private merchant, the difference of rates between his sales and purchases constitutes his profit.

Bills of exchange between distant markets are usually made payable at a certain period *after sight*, those between near markets are more commonly made payable at a period *after date*. Thus, a merchant in New York or Calcutta draws a bill on London at sixty or ninety days', or three or six months' sight, while a merchant in Paris will probably draw on his correspondent in London at two, three, or four months' date. In the former case, when the bill is presented for acceptance, the drawee writes the date on which it is presented before his name, and the currency of the bill begins with this date, not, as in the latter case, with the date on which the bill is drawn. Another form of drawing a foreign bill which may now be considered antiquated, is drawing *at usance*. The custom of a particular market commonly lead to bills being drawn upon it more frequently at one particular term or period of currency than at any other. The special term or period of currency depends upon the custom of the place of issue, with special reference to its distance from the place of payment of the bill. Bills on New York, for example, being frequently drawn at sixty days' sight, this is called the *usance* of New York, and a bill drawn on New York 'at usance' would be payable at sixty days' sight. Another mode more useful, though now also comparatively rare, is drawing at par, or par of exchange. This also affects the period the bill has to run. Exchange is at par between two countries when a certain

weight and fineness of the coin of one country exchanges for an equal weight and fineness of the coin of the other, or when the exchange is in the exact ratio of the weight and fineness of the currency. This is the basis of drawing at par, but the practical use of the term is not precisely limited to this signification. Assuming, for example, that the actual rate at which a dollar in New York would exchange for sterling money is 4s. 2d., it may happen that sterling money is worth less in New York than in London, and that a person wishing a bill on London would not get 4s. 2d. for his dollar, but he may have a particular reason for wishing to remit at this exact rate; he therefore proposes to pay the exchange not in a direct deduction from the value of the dollar, but in time. A bill is therefore drawn, 'Pay to A. B. £100 sterling, the equivalent of \$480, at par of exchange'. The acceptor of the bill calculates the exact value at time of presentation for acceptance of \$480 in sterling money, and the period when the payment of £100 would be equivalent to the payment of this sum, and fixes the due date accordingly.

The difference of exchange between the country on which the bills of exchange are drawn and that of the country where they are drawn forms an element in the calculation of the value of the bill when it is sold or remitted.

Sometimes, both in inland and foreign bills, instead of the general expression, 'for value received', or, 'value as advised', the actual merchandise against which the bill is drawn is specified, as in a bill drawn from New Orleans, value in \diamond 1 to 100, 100 Bales

Cotton $\text{\textcircled{C}}$ *Calisto*. A bill of exchange drawn in this way does not necessarily convey a lien upon the goods, but in particular cases it may have important legal consequences. If, for example, the goods were shipped on consignment, that is, sent to a foreign market for sale on account of the shipper, the holder of a bill drawn by the shipper in this way could, if it were unpaid, establish a lien upon the goods as against the creditors of the consignee; but if the goods were sold by the shipper, he could have no prior claim against the creditors of the purchaser.

To make the lien upon the goods against which a bill of exchange is drawn perfect, it is customary to attach to the bill what are called shipping documents, that is, the bills of lading (see below) for the goods, and sometimes an invoice or specification of their value. The purchaser of a bill, however, has no absolute security without reliance on the good faith and character of the drawer.

When a foreign bill has reached maturity, that is, the due date of payment, and is not honoured, or duly paid, it must be *noted* or *protested*. Protesting is a legal form, in which the payee is declared responsible for all consequences of the non-payment of the bill. Noting is a temporary form, used as a preliminary to protesting. It consists in a record by a notary-public of the presentation of the bill, and of the refusal of the payee to honour it. When a bill is noted, the extension of the legal protest may be delayed for a period of six months, without affecting any right of the holder, but unless a bill is noted for non-payment on the due date, the indorsers are freed from responsibility to pay it. A bill of exchange must also be protested for non-acceptance before proceeding against the drawer or indorsers.

When a bill is drawn in one country but payable in another, the *due date* is determined according to the law of the country of payment. In determining the due date of a bill, a legal allowance, varying in different countries, called *days of grace*, has to be taken into account. In Great Britain three days of

grace are allowed on all bills indiscriminately, except bills drawn on demand, which are consequently called 'orders', and are written on a penny stamp, whatever be their amount. No action can be brought for payment of a bill until the expiration of the *last day of grace*. If the last day is a Sunday, Christmas Day, Good Friday, or a day appointed by royal proclamation as a public fast or thanksgiving day, the bill becomes due and payable on the preceding business day. Until recently a bill of exchange payable at sight was considered a bill, had a stamp affixed according to its value, and was paid three days after sight. This was the practice at least in Liverpool and other provincial towns, but the London practice of regarding all such bills as orders on demand gradually was adopted, and by the act 34 and 35 Vict. cap. lxxiv. (1871) days of grace on bills payable at sight were abolished. In France days of grace are abolished by the article 135 of the Code de Commerce. Consequently, a London bill drawn on Paris would not be entitled to the time allowance called *days of grace*. In other countries they vary considerably.

A bill in Great Britain to be legal must, as above noticed, be drawn on stamped paper, or have a stamp affixed; and a foreign bill, before being negotiated, must have a stamp of the same value as an inland bill affixed to it. The value of the stamp is 1*d.* for £5, and rises at fixed stages with the value of the bill at the rate of 1*s.* per £100.

The laws in Great Britain, in regard to promissory notes and bills of exchange, are nearly alike. The term of prescription on bills is usually understood to be six years; some modern authorities, however, maintain that a bill duly protested will remain in force for forty years.

The validity of the form of a bill, drawn in one country, but negotiated, accepted, or made payable in another, is determined by the law of the country of origin. But, if any question arise as to the form of any contract connected with the document (e.g. the acceptance), that is decided by the law of the country in which such contract is entered into. If a foreign bill is not properly stamped according to the law of the place of its origin it is not rendered invalid thereby. If it satisfies the form required by the law of the United Kingdom, it may be considered valid as regards all parties to it in the United Kingdom, for the purpose of enforcing its payment.

Where a bill is lost before it becomes overdue, the holder may apply to the drawer for another to the same effect. He must give security to the drawer, if required, to protect him against the claims of other persons into whose hands the bill may pass in the event of its being subsequently found. The drawer is then bound to give the holder the duplicate he requires, and where any proceedings are taken the court or judge may order the loss of the bill not to be set up in case a satisfactory indemnity is given to the party who would otherwise resist payment.

BILL OF HEALTH, a certificate or instrument signed by consuls or other proper authorities, delivered to the masters of ships at the time of their clearing out from all ports or places suspected of being particularly subject to infectious disorders, certifying the state of health at the time that such ships sailed. A *clean bill* imports that at the time that the ship sailed no infectious disorder was known to exist. A *suspected bill*, commonly called a *touched patent* or *bill*, imports that there were rumours of an infectious disorder, but that it had not actually appeared. A *foul bill*, or the absence of clean bill, imports that the place was infected when the vessel sailed. (MacCulloch's Com. Dic.) See **QUARANTINE**.

BILL OF LADING is an engagement signed by the

captain or owner of a vessel acknowledging the delivery on board his vessel of certain specified merchandises 'In good order and condition', and undertaking to deliver them 'in like good order and condition' at the port of destination. The particular conditions of the contract are specified in the bill of lading. There are common printed forms which are usually adhered to, but additional clauses are often added by the owner or shipper, and many large shippers, and particularly owners of vessels, use forms printed for themselves. The bill of lading usually specifies the amount and term of payment of freight, which is sometimes paid on shipment, sometimes on delivery of the goods, but for payment of which the goods are held as a lien. Each copy must be written on a sixpenny stamp, under a penalty of fifty pounds. Bills of lading can be transferred by indorsement (see **BILL OF EXCHANGE**).

BILL OF SALE, in the law of England, is a formal deed for the conveyance or transfer of personal chattels, as household furniture, stock in a shop, shares in a ship, &c. It is often given to creditors in security for money borrowed or obligation otherwise incurred, empowering the receiver to sell the goods if the money is not repaid with interest at the appointed time, or the obligation not otherwise discharged. Important amendments were effected by the Bill of Sales Act (1882), such as, that the bill must have a schedule attached containing an account of the goods, that it must be attested by a credible witness, that the bill is void if made for less than £30, and that when put in force the goods are not to be removed or sold until after five clear days. This act is not applicable to Ireland or Scotland.

BILLAUD-VARENNE, JACQUES-NEOLAS, a noted French revolutionist, was born at Rochelle on 23rd April, 1756. He was bred to the legal profession, and having come in 1785 to Paris, political events soon began to occupy his attention, and in 1789 three treatises appeared from his pen, entitled respectively *Despotisme des Ministres de France*; *Dernier Coup Porté aux Préjugés et à la Superstition*; and *Le Peintre Politique*. Another publication, *Acéphalocratie*, which appeared in 1791, subjected him to a judicial prosecution, and he was obliged to conceal himself for a time. He emerged from his retreat on the triumph of his party in September, 1791, and was elected a member in 1792 of the national convention. On the trial of the king he voted for execution within twenty-four hours. He contributed to the overthrow of the Girondists, and was subsequently chosen president of the convention and member of the committee of public safety, and in that capacity framed the *Bulletin des Lois*, and assisted in organizing the revolutionary government. In 1795, on a reaction having taken place against the ultra party, he was arrested, and along with Collot d'Herbois banished to Cayenne. On the overthrow of the directorial government he refused the amnesty offered by Bonaparte. In 1816, on the restoration of Cayenne to France, he was obliged to take refuge at Port au-Prince, in the island of St. Domingo. Here he died in poverty on June 3, 1819.

BILLIARDS, a well-known game, requiring great skill of hand and eye. Billiards may, indeed, be said to rank first among games of physical skill in respect to the qualities necessary to command success in it, and the great amount of experience needed to make an accomplished player. Billiards is said to have been a French invention. It is first noticed as a fashionable amusement when recommended to Louis XIV. by his physicians. It has reached its present state by successive improvements, which are curiously associated in the French annals of the game with the successive revolutions in the history of the country. The mode in which it is now played in France is very

different from what prevails in Great Britain, the British apparently being the antiquated form of the game. Tables with pockets, the common form in Britain, are now in France 'relegated to the remotest villages'. Carambolage, or the cannon game, as it is called in England, is now the favourite game in France.

Billiards is played with ivory balls on a flat table, and various modes of play, constituting many distinct games, are adopted, according to the tastes of the players, some being, as already hinted, more in favour in one country, some in another. The common English billiard-table is an oblong, about 12 feet by 6, covered with fine and very smooth green cloth, and surrounded with cushions which are made elastic, much of the skill of the game consisting in calculating the rebound of the balls in various directions from the cushions. Along the edges of the table are six semicircular holes arranged at regular intervals in the cushion, through which the balls are allowed to drop into small nets called pockets, under the sides of the table. The pockets are placed one at each corner of the table, and two opposite each other in the middle of the long sides. Each player is provided with a cue (formerly a mace) to strike the balls. The cue is an instrument of wood from 4 or 5 to 6 or 8 feet long, rounded in form, and tapering gradually from 1½ inch in diameter at the butt to ½ inch or less at the point, which is tipped with leather and rubbed with chalk to make the stroke smooth.

In the common game, which elicits the greatest variety of skill, two players engage. Each has a white ball, one distinguished from the other by a spot, and a red ball is common to the two players. In beginning the game, the red ball is placed on a spot near one end of the table, and equidistant from the corner pockets. A line is drawn across the table at the other end, marking off a space called baulk. In this space a semiole is described, out of which the player, in commencing, must send his ball, either striking the red or giving his opponent a 'miss', that is, playing without striking the red ball, which scores one against him. When the game has commenced, the player is at liberty to strike at either his opponent's ball or the red, and continues to play as long as he succeeds in scoring. The whole of an uninterrupted run of play is called a break.

There are various modes of scoring in the common game. When a player strikes both balls with his own, it is called a cannon, and counts two; when he pockets his own ball, after striking another, it is called a losing hazard, and counts two if made off his opponent's ball, three if off the red; when he pockets his opponent's ball it counts two; when he pockets the red, three. These strokes are called winning hazards; but notwithstanding this name, it is usually considered bad play to pocket your opponent's ball, as it is then taken off the table. The others may be restored as often as pocketed. When the player fails to strike either ball it scores one against him; if he goes into a pocket without striking it scores three against him. The effect of a stroke at billiards depends on so many conditions, that both theoretical knowledge and practical skill are required to make a player proficient. The force of the stroke; the point of the ball struck with the cue, the point of contact of the player's ball with the object ball, the effect of recoil from the cushions, are all subject of calculation, and constitute a theory of the game on which many treatises have been written. The skill acquired by celebrated players is very great; amateurs of moderate pretensions usually consider a game of 50 or 100 points as offering sufficient scope for the exhibition of their skill, but great players will frequently make several hundred at a break.

The rules of the game are very numerous, and as they are always to be found in the rooms where it is played, they need not be given here.

After the ordinary game, the most favourite varieties in Great Britain are *pyramide* and *pool*. The former is so called from the position in which the balls are placed at the beginning of the game. It is played with fifteen balls; and the object of the players is to try who will pocket, or 'pot', the greatest number of balls. Thus the pyramid player acquires a greater skill in potting balls from every variety of position than the billiard-player, but as he is limited to this particular stroke, he has less scope for the exercise of a diversity of skill. Pool is also a game of potting, but is played somewhat differently. It is a favourite game with those who play for stakes, inasmuch that it may be considered almost exclusively a gambling game. It embraces an indefinite number of players, each of whom is provided with a ball of a different colour from any of the others. They play in succession, and each tries to pot his opponent's ball. If he succeeds with one he goes on to the next; if he fails, another player takes his turn, playing first on the ball of the last player. There are thus two points which a pool-player has to aim at: to pot as many balls as possible, and to keep his ball in a safe position relatively to that of the following player, as the player whose ball is potted has to pay the penalty prescribed by the game.

Billiard-tables without pockets are now common in America, the game being entirely a cannon one. In America a four-pocket table is also in use. The American term for cannon is *carom*, and in American play two red balls (or a red and a pink) and two white ones are commonly employed.

BILLINGSGATE, a fish-market in London, on the banks of the Thames, near London Bridge, established in 1699. It has been frequently improved, and was rebuilt in 1852 and in 1874-76. From the character, real or supposed, of the Billingsgate fish-dealers and frequenters of the market, the term *Billingsgate* is applied generally to coarse and violent language.

BILLINGTON, ELIZABETH, the most distinguished female singer of her day in England. She was born in England in 1768, her father being a German oboe player, her mother an English singer. She made her appearance as a singer at the age of fourteen, and at sixteen married Mr. Billington, a double-bass. She made her *début* as an operatic singer in Dublin, and afterwards appeared at Covent Garden, where she secured an engagement for the remainder of the season of 1786 for £1000, the manager giving her two bonafide. She visited France and Italy, and Bianchi composed the opera of *Inez de Castro* expressly for her performance at Naples. After several years spent in Italy she returned to England in 1801, and sang in Italian opera for a series of years. She retired from public life in 1811. She quitted England in 1817, and died in the Venetian territory in the following year. Besides being a singer she was also an excellent pianist.

BILLION, in Britain and Germany, the term used to denote a million millions. In France, America, and elsewhere it denotes a thousand millions. A similar difference is found in the use of the terms trillion, quadrillion, &c.

BILLON, an alloy of copper and silver, in which the former predominates, used in some countries for coins of low value, the object being to avoid the bulkiness of pure copper coin.

BILLY-BOY, a flat-bottomed, bluff-bowed vessel, generally rigged as a sloop, with a mast that can be lowered so as to admit of passing under bridges. These vessels generally belong to the Humber ports.

BILSA. See **BITILAE.**

BILSON, THOMAS, a learned divine, born at Winchester, 1547; was educated at Winchester School, and after completing his studies at New College, Oxford, became successively head-master of the school and canon of the cathedral of Winchester. In 1585 he published a work entitled *The True Difference between Christian Submission and Anti-Christian Rebellion*, intended mainly to defend the government and policy of Elizabeth; and in 1598 another work, entitled *The Perpetual Government of Christ's Church*, still considered one of the ablest defences of Episcopacy. In 1608 he was made Bishop of Worcester, and was translated in the following year to Winchester. In 1603 Bilson preached the coronation sermon before King James, and in 1604 he took a prominent part in the celebrated conference at Hampton Court. The translation of the Bible, executed during the reign of James, was partly submitted to his revision. He died in 1616, and was buried in the south side of Westminster Abbey.

BILSTON, a town of England, in Staffordshire, 3 miles S.E. from Wolverhampton. It extends along a height for nearly 2 miles, and becomes conspicuous at a considerable distance by the smoke of the numerous furnaces employed in its extensive manufactures. These consist chiefly of iron bars, iron and brass castings, iron wire, machinery, steam-engines, iron bedsteads, coarse pottery, and tin, japanned, and enamelled wares. A particularly fine sand for casting, and a very hard stone, suitable for grindstones, are obtained abundantly in the neighbourhood. Pop. in 1871, 24,188; in 1891, 23,453; in 1901, 24,034.

BIMANA, in zoology, a term introduced by Blumenbach and adopted by Cuvier to describe the order of mammals having two hands, of which man is the sole species. The distinction, however, is not really one of zoological importance, and in consequence most naturalists have reverted to the Linnæan method of classifying man with the apes, monkeys, and lemurs in an order Primates.

BIMETALLISM. See **SUPPLEMENT.**

BIMLIPATAM, a seaport of India, in the Vizagapatam district of Madras, 18 miles N.E. of Vizagapatam, with a brisk trade. Pop. (1891), 9827.

BINAB, a town, Persia, province of Azerbaijan, 10 miles E. of Lake Urumia. It is one of the cleanest towns of Persia, is surrounded by orchards and vineyards, and from its mild climate is well adapted for the cultivation of grapes, vast quantities of which are exported to Tabreez. Pop. about 7500.

BINCHE, a town of Belgium, in the province of Hainaut, on the Haine, about 10 miles W. of Mons, with glass-works, tanneries, and lace manufactures. Pop. (1897), 10,887.

BINDRABAN, or **BRINDABAN**, a town in India, in the North-western Provinces, in the district of Mattra, and 35 miles N.W. of the town of Agra, on the right bank of the Jumna. It is famous as the scene of the youthful sports of Krishna, who has still many temples here. Among these is a cruciform pagoda, which is one of the most massy and elaborate of Brahmanical buildings. Pop. (1881), 21,467; (1891), 31,611.

BINDWEED, the popular name of plants of the genera *Convolvulus* and *Calyptegia*, belonging to the order Convolvulaceæ (which see), especially of *Convolvulus arvensis* and *Calyptegia sepium*. The black bryony is the black bindweed; *Smilax aspera* is called rough bindweed; and *Solanum dulcamara* (the bitter-sweet) is the blue bindweed of Ben Jonson.

BINGEN, a town of Germany in the grand-duchy of Hesse, situated on the left bank of the Rhine and the right of the Nahe. Bingen existed in the time of the Romans, by whom it was called *Vincum* or *Bin-*

gium. The bridge over the Nahe is said to have been built by Drusus, and bears his name. In the neighbourhood are the remains of a castle, where the Emperor Henry IV. was detained a prisoner in 1105, and the Maunethurm or Mouse-tower, in the middle of the river, the scene of the ancient legend of Archbishop Hatto who was devoured by rats. A dangerous passage in the Rhine, called the Bingerloch, has been opened up by the blasting of sunken rocks, leaving a channel of 210 feet wide. Bingen is the market for the sale of wines produced in the neighbourhood. Pop. (1895), 8187.

BINGHAM, JOSEPH, born at Wakefield, Yorkshire, in 1668, distinguished himself as a student at University College, Oxford, and devoted his attention particularly to ecclesiastical antiquities. He graduated in 1688, and became a fellow the following year; but had to withdraw from the university on the erroneous charge of preaching unsound doctrines. He now became curate of Headbourn-Worthy, near Winchester, and there, while possessed of a scanty living on which his numerous family could barely subsist, had the merit of composing one of the most learned works of which his church can boast. This work, *Origines Ecclesiasticæ*, or *The Antiquities of the Christian Church*, was published in ten vols. 8vo (1708-22), and is still a standard on the subjects of which it treats. The best modern edition is that published at the Clarendon Press (1855, ten vols.). It was soon translated into Latin and published in Germany. In 1712 he was collated to the living of Havant, near Portsmouth, and he died there on August 17th, 1723.

BINGHAMPTON, a town, United States, capital of Broome county, state of New York, 80 miles from Syracuse, at the junction of the Chenango and Susquehanna rivers. It is handsomely laid out, and is a prosperous and active place, with numerous churches, schools, and other institutions, and manufactures of cigars, flour, shoes, glass-ware, machinery, tools, and other articles. Pop. (1880), 17,315; (1890), 35,005.

BINGLEY, a parish of the West Riding of Yorkshire, containing a town of the same name, on the Aire, 5½ miles N.W. of Bradford. The town contains the interesting church of All Saints (restored 1871) in the perpendicular style, several other places of worship, an endowed grammar-school, and a mechanics' institute. The chief industry is worsted spinning. Pop. (1891), 17,395; (1901), 18,448.

BINNACLE, a case or box fixed on the deck of a ship, in front of the wheel or steering-apparatus, containing the compass for steering the ship, and lights to show the compass at night.

BINOMIAL, in algebra, a quantity consisting of two terms or members, connected by the sign + or -. The *binomial theorem* is the celebrated formula which shows how to obtain any power of a given binomial, as $a + b$, from the two terms a and b , and the exponent of the power. This theorem, frequently called the *Newtonian theorem*, on which the system of analysis is principally founded, was known, as far as relates to integral positive exponents, to several mathematicians before Newton. But Newton was the first who taught its application to fractional and negative exponents; and this discovery, one of the most important of those made by that great man, is engraved upon his tombstone.

BINUE. See **BEINUWE.**

BIOLOGY (Gr. *bios*, life; *logos*, a discourse), a comprehensive term for those departments of science that treat of living beings, including under this head both animals and plants. It therefore comprehends both botany and zoology, in all their details. See these articles, and also many others such as **CELL**, **EVOLU-**

TION, GENERATION (SPONTANEOUS), LIFE, PHYSIOLOGY, PROTOPLASM, REPRODUCTION, SELECTION (NATURAL), &c.

BION, born in Smyrna, or in its neighbourhood; a Grecian pastoral poet, of whose life no account is to be found. The elegy which Moschus, his friend and disciple, composed on the occasion of his death, seems to imply that he was a contemporary of Theocritus, and died of poison, 3rd century B.C. He probably lived in Sicily or Magna Græcia. Among the few poems written by him which have descended to our times, his elegy on Adonis is considered as the best. The poems of Bion, together with those of Moschus, are generally found as an appendix to the *Idyls* of Theocritus. They have recently been translated in to English, along with the poems of these two authors, by Andrew Lang.

BION or **BOBYSTHENES**, a Greek philosopher contemporary with Erastosthenes (born B.C. 275), and with Zeno the Stoic. He studied philosophy at Athens, first under Crates of the Cynic school, then took lessons of Theodorus, surnamed the Atheist; and at last, considering his studies completed, set up for himself. It is not easy to ascertain what his opinions were, as only a few fragments of his numerous writings have been preserved; but he was accused of Atheism, and apparently on good grounds, as he is said to have regarded all questions relative to the nature of the gods and divine providence as indifferent. He died at Chalcis in Eubœa about B.C. 241.

—Another **BION** (fl. B.C. 400), who lived at Abdera, and belonged to the family of Democritus, distinguished himself as a mathematician, and is said by Diogenes Laertius to have been the first who taught that there were countries in the world where the year consists only of a single day and a single night, each lasting for six months. He must therefore have been acquainted both with the spherical form of the globe and the obliquity of the ecliptic. Unfortunately nothing more is known of his history.

BIOPLASM. See **PROTOPLASM**.

BIOT, **ÉDOUARD CONSTANT**, an eminent Chinese scholar, son of Jean Baptiste Biot, was born at Paris on July 2nd, 1803, attended the College of Louis XIV., and in 1822 became a pupil in the Polytechnic School. After accompanying his father on a scientific tour to Italy in 1825–26, he undertook the construction of a railway from Lyons to St. Etienne, the first in France. In 1833 he retired from active life, and devoted his leisure to the study of the Chinese. He died on March 12th, 1850. He was the author of the interesting work, *Causes de l'Abolition de l'Esclavage Ancienne en Occident* (Paris, 1840). As the fruit of his studies on China he published numerous articles in the *Journal des Savants* and *Journal Asiatique*, as well as several larger works, more especially *Dictionnaire des Noms, Anciens et Modernes, des Villos et Arrondissements compris dans l'Empire Chinois* (Paris, 1842), and *Essai sur l'Histoire de l'Instruction Publique en Chine* (1847). Besides translations of Chinese works—for example, the historico-chronological *Tcheou-chou-ni-kien* (Paris, 1842), and the *Astronomical Tcheou-pai*—he wrote a *Notice sur quelques Procédés Industriels connus en Chine, au 17me Siècle*; an *Examen de diverses Séries de Faits relatifs au Climat de la Chine*; and *Chine et Indo-Chine*. The printing of his translation of the Chinese Imperial Geography, *Tcheou-li*, was interrupted for some time by his death.

BIOT, **JEAN BAPTISTE**, one of the most celebrated mathematicians and physicists of the nineteenth century, was born at Paris, 21st April, 1774, and died there 3rd Feb. 1862. He was educated at the College Louis-le-Grand, and in 1793 entered the artillery service. Shortly afterwards he entered the École Poly-

technique, and thenceforth devoted himself to the study of mathematics and the natural sciences. After teaching physics for some years at Beauvais, he became professor of the same subject in the College de France in 1800, and in 1803 was elected a member of the Institute. In 1804 he made a balloon ascent with Gay-Lussac, and in 1806 was made member of the Bureau des Longitudes. In 1809 he became also professor of physical astronomy in the University of Paris. With the exception of three journeys, undertaken in connection with the measurement of a degree of the meridian—viz. to Spain in 1806–8, to Scotland, Orkneys, and Shetland in 1817, and to Spain and Italy in 1824–25—his whole life was quietly passed in study and teaching. He published some excellent textbooks, which became widely known beyond France, such as the *Essai de Géométrie Analytique*; *Traité de Physique Expérimentale et Mathématique*; and *Traité Élémentaire de Physique Expérimentale*, as well as works on the astronomy of the ancient Egyptians, Indians, and Chinese. His most valuable contributions to science, however, are chiefly contained in communications to learned societies and periodicals. There are few branches of physics which were not advanced by his labours; and in optics especially he made some valuable investigations, particularly in connection with refraction and polarization.

BIR, or **BIREDJIK**, a town in Asiatic Turkey, 80 miles north-east of Aleppo, on the side of a steep hill on the left bank of the Euphrates, which is here about 600 yards wide, and 10 to 12 feet deep. The town is surrounded on the land side by a wall, with towers at the angles, and pierced with loopholes. The streets are narrow but clean. In the centre, on a steep rock, is an old ruined fortification. Bir has long been the point where caravans and travellers from Aleppo to Orfah, Diarbekir, Bagdad, and Persia, cross the Euphrates. It is at the head of the navigation of that river. Pop. 8000 to 10,000.

BIRAGUE, **RENÉ DE**, born at Milan of a distinguished family in 1507 (or 1506), incurred the hostility of Louis Sforza the duke, and sought an asylum in France, where Francis I. received him favourably, made him councillor of the Parliament of Paris, and governor of Lyons, and sent him to the Council of Trent. Under Charles IX. his advancement was still more rapid, and in 1570 he was made keeper of the seals. In this capacity he was a party in the secret council at which the massacre of St. Bartholomew was organized. His character well fitted him to be a leader in that infamous atrocity; and he was generally believed to have repeatedly employed poison to rid himself and his patroness, Catharine de' Medici, of persons who stood in their way. With all his wickedness, however, he managed to play the hypocrite, and with so much success that he was made a cardinal in 1578, and besides held the bishopric of Lavaur and several rich abbeys. He died Chancellor of France in 1583.

BIRCH (*Betula*), a genus of trees belonging to the natural order (or sub order) *Betulaceæ*, which comprises only the birches and alders. The principal habitats of the trees of this order are Europe, Northern Asia, the Himalayas, and North America. The common birch is indigenous throughout the north, and on high situations in the south of Europe. It is extremely hardy, and only one or two other species of trees approach so near to the north pole. There are two varieties natives of Britain, *Betula alba*, and *B. alba pendula*, or weeping-birch; the latter is by far the more valuable and ornamental. When a plant it may readily be distinguished by the touch, its bark being covered over with rough exudations, while that of the common tree is soft and velvety. Each variety

is found exclusively in some districts, but frequently they are interspersed. Throughout the most remote parts of the Highlands of Scotland the birch is often found covering extensive tracts on rocky elevations, where no other ligneous plant is to be met with. It also grows in glens and ravines, adorning the margins of lakes and rivers, where the silvery whiteness of its trunk and the light and airy habit of its spray form beautiful and interesting pictures, even in the absence of every other tree. Though it is often found associated with the alder on swampy ground, yet few trees more successfully resist drought. Adapting itself to various soils and situations, it possesses a wider range than any other tree. It is well suited to form a cover on ground from which Scotch pine timber has been recently removed; the *crux*, which always overspread such places, though hostile to plants in general, are favourable to the birch, which commonly springs up and becomes the successor of the pine. The common tree, where it grows wild, attains a height of about 80 feet, and the weeping variety about 40 feet; but both sorts rise to a much greater height when formed into plantations, particularly when interspersed with other trees. Some of the finest weeping-birches in Britain stand on the banks of the river Findhorn, near Forres, in Morayshire; these are 60 feet high, with trunks upwards of 2 feet in diameter, and display pendent masses of spray 10 feet in length, adding a graceful variety of verdure to scenes in themselves of great beauty. Although the birch is considered by no means a valuable tree, yet its wood, which is light in colour, and firm and tough in texture, is used for a variety of purposes. Not long ago, in many parts of the Highlands, the birch may be said to have been the universal wood, and was used by the Highlanders for every purpose. They made their beds, chairs, tables, dishes, and spoons of it, and even manufactured ropes and horse-harness by heating and twisting its spray. The brushwood is used in forming wicker fences to prevent the inroads of cattle and sheep, in thatching cottages, and in forming brooms or besoms. The wood is largely used for fish-casks and hoops, and for smoking hams and herrings. Turners use it for trenchers, bowls, ladles, and other wooden ware. Ox-yokes, small screws, women's shoe-heels, pattens, and in France wooden shoes are made of it. Birch-trees are not unfrequently planted along with hawthorn, for the purpose of procuring wood to be converted into charcoal for forges. This charcoal is much esteemed, and the soot which is formed on burning the wood constitutes a good black substance for printers' ink. Nearly all the other parts are applicable to useful purposes. The bark is employed in the tanning of leather, and by fishermen for preserving their nets and cordage. In northern Europe, Asia, and America it is utilized for a great variety of purposes. The North American Indians use it for canoes, boxes, buckets, baskets, kettles, and dishes, curiously joining it together with threads made of roots of the cedar-tree. It is serviceable in dyeing a yellow colour. In Norway it is dried, ground, mixed with meal, and boiled with other food for swine. The houses or huts in many parts of the N. of Europe are covered with the outward and thicker part of the bark, instead of slates or tiles. It is spun into a coarse kind of cordage, woven into shoes and hats, and in some places even made into drinking-cups. The Laplanders fasten together large pieces of it to keep off the rain. Abounding in resinous matter, slices of the bark are sometimes tied together to make torches. During a scarcity of corn it has, in several instances, been ground with bread corn, and successfully used as food for men. The leaves afford a yellow dye. The sap, from the amount of sugar it contains, affords a kind

of agreeable wine. Birch-wine is produced by the tree being tapped by boring a hole in the trunk, during warm weather, in the end of spring or beginning of summer, when the sap runs most copiously. It is recorded that during the siege of Hamburg, in 1814, many birch-trees in that vicinity were destroyed in this manner by the Russian soldiers. The dwarf birch, *Betula nana*, is a low shrub, a native of parts of the Highlands of Scotland and of Arctic regions generally. It is never more than two or three feet in height, and is generally much less; a full-grown plant being thus a very tiny example of a tree. It is used as fuel, and as stuffing for beds, and its seeds furnish food for ptarmigan and other birds. A similar species is a native of the Antarctic regions. Several American species of birch deserve mention. Among these is the black birch (*B. nigra*), which grows to the height of seventy feet, and produces hard and valuable timber. It is also known as the red birch, from the redness of the bark in the young trees. Another species, the cherry birch or sweet birch (*B. lenta*), is also called the black birch. It grows to a similar height with the preceding, and yields even more valuable timber, used in making furniture, &c., being tough, fine-grained, and taking on a good polish. It has been introduced into Britain, though not much known there. The paper birch (*B. papyracea*) is another American species which also attains a large size, and by some is regarded as a mere variety of the white or common birch. Its habitat extends within the Arctic circle, but it becomes rare and stunted in the extreme north. It receives its name from the fact that thin strips of the brilliant white bark are sometimes used as a substitute for paper. The bark of this species is put to perhaps a greater variety of uses than that of any other, its wood and sap being also utilized. Another American birch is the yellow birch (*B. cretula*), so named from the golden colour of the outer bark. It is a large-leaved species, yielding timber used for ship-building, &c., and is a native of the eastern parts of Canada and the north-east of the United States. Of Himalayan species may be mentioned *B. bhoyputra*, the Indian paper birch. Its thin papery bark has been used as paper from a remote period, and is still commonly used for packing purposes, for lining the flexible tubes of hookahs, and in other ways, while the wood is tough, and is employed in making articles of various kinds. In its native mountains it may be found at an altitude of 10,000 to 13,000 feet.

BIRCH, JOHN, a soldier of note in the English civil war, was born 7th April, 1616, in Lancashire, and became a merchant in Bristol. He was a Presbyterian in religion, and took the side of the Parliament, acting as a captain of volunteers at the siege of Bristol by the Royalists. After the surrender of Bristol he went to London, and raised a regiment of which he became colonel, and with which he took part in some important military operations. On the institution of the 'new model' he was ordered to join the army of Fairfax and Cromwell in the west of England, and had Bath entrusted to his care. He commanded a body of horse and foot at the storming of Bristol, an affair in which he so highly distinguished himself as to receive special commendation from Cromwell in his report to the Parliament. In 1645 he was sent against Hereford, and by a stratagem succeeded in gaining possession of the city, and with this the special thanks of Parliament. This was his last feat of importance as a soldier. As a Presbyterian he objected to many of the proceedings of the party of Cromwell, and was repeatedly thrown into prison. He took an active part in bringing about the restoration of Charles II., and after this event held an important post as auditor of excise. In the

latter part of his life he was a prominent member of Parliament, representing Penryn in 1871-78, and Woolly for the rest of his life. He died 10th May, 1891. He was a man of great personal strength and stature, a rough but most effective public speaker, and had remarkable talents for business and practical affairs.

BIRCH, SAMUEL, a distinguished Egyptologist, was born in London, 3rd November, 1813, his father being the rector of St. Mary Woolnoth. He was educated at Merchant Taylors' School, and at the age of twenty-three was appointed an assistant in the department of antiquities in the British Museum. He gradually rose to higher positions in the museum, and latterly became keeper of the department devoted to Egyptian and Oriental antiquities, a post which he retained till his death, on the 27th Dec., 1885. His whole life was devoted to studies and work connected with his official duties, and was naturally uneventful. His labours did much to advance the study of oriental archaeology, and his eminence in his own province was duly recognized by learned bodies and institutions. In 1862 he received the degree of LL.D. from the university of St. Andrews; in 1875 the university of Cambridge conferred on him the same degree, and next year he was honoured by that of D.C.L. from Oxford. In 1870 he assisted in founding the Society of Biblical Archaeology, and became its first president. In 1874 he successfully presided over the International Congress of Orientalists that met in London in that year. His studies ranged over a wide field, but it is on his eminence as an Egyptologist that his reputation chiefly rests. It has been said that 'he found the language of Egypt a puzzle, and left it at his death in the position of one of the most important philologies of the world'. Among his works, exclusive of contributions to learned societies, encyclopedias, &c., are: *Introduction to the Study of the Egyptian Hieroglyphs* (to accompany Gardiner Wilkinson's work on Egypt; 1857); *History of Ancient Pottery, Egyptian, Assyrian, Greek, Etruscan, and Roman* (1857); *Himyaritic Inscriptions of Southern Arabia* (1863); *Dictionary of Hieroglyphics and Grammar of the same in the fifth volume of the English Edition of Bunsen's Egypt's Place in Universal History* (1867); *Guide to the Egyptian Galleries of the British Museum* (1874); *New Edition of Wilkinson's Manners and Customs of the Ancient Egyptians* (1878), &c.

BIRCH, THOMAS, an industrious historian and biographer of the eighteenth century. He was born in London in 1705, and his father, who was a Quaker, practised the occupation of a coffee-mill maker, to which the son also was destined. His early taste for reading induced him to prefer a literary life, which he was permitted to choose on condition of supporting himself by his own exertions. He accordingly, after some previous tuition, became usher in three different schools, and then went to Ireland with Dean Smedley. Having left the Quakers, he took orders in the church in 1730, and obtained in 1732 a living in Essex, through the patronage of the attorney-general, afterwards Lord Hardwicke. In 1734 he engaged with some coadjutors in writing the *General Historical and Critical Dictionary*, founded on that of Bayle, and completed, in ten vols. fol., in 1741. He subsequently obtained various preferments in the church, and for about twenty years before his death held the rectories of St. Margaret Patens, London, and Depden, in Suffolk. In 1753 he received the degree of D.D. from Marischal College, Aberdeen, and the same degree was conferred on him by the Archbishop of Canterbury. In January, 1766, he was killed by a fall from his horse on the road between London

and Hampstead. Birch had formed very extensive manuscript collections, which, together with his library of printed books, he bequeathed to the British Museum. He produced a large number of historical and biographical works in the course of his laborious life, and served as one of the pioneers of literature. He collected fully and faithfully, but without much discrimination, materials relating to the various subjects of his research which are calculated to afford important assistance to writers possessed of more taste and judgment. Johnson was repeatedly obliged to him for literary information, and for many years corresponded with him. Among his works are: *Life of the Right Honourable Robert Boyle*; *Historical View of the Negotiations between the Courts of England, France, and Brussels, 1592-1617*; *Life of Archbishop Tillotson*; *Memoirs of the Reign of Queen Elizabeth*, from 1581 till her death; *History of the Royal Society of London*; *Life of Henry, Prince of Wales*.

BIRCH-PFEIFFER, CHARLOTTE, German actress and dramatic writer, was born at Stuttgart, 23rd June, 1800, her maiden name being Pfeiffer. She first appeared on the stage in her thirteenth year at Munich, and soon acquired a great reputation, her special rôle being that of the heroine of tragedy. In 1825 she married Christian Birch, a writer of some note. After playing with success at places as far apart as St. Petersburg, Amsterdam, and Pesh, in 1837 she took the management of the theatre at Zurich, and remained in this capacity till 1843. Next year she was engaged for the Theatre Royal, Berlin, and here she remained till her death, an event which took place, August 24th, 1868. Her plays, which were mostly founded on novels, became well known on almost every stage in Germany, and give evidence of real dramatic talent, as well as of a knowledge of stage effects and what would suit the taste of the theatre-going public. Victor Hugo's *Notre Dame* and Charlotte Brontë's *Jane Eyre* furnished her with materials for two of her dramas. She also wrote novels and tales. Her collected dramatic works appeared at Leipzig in twenty-three volumes (1863-80); her narrative writings in three (1863-65). Her daughter has become well known as a novelist under the name Wilhelmine von Hillern.

BIRD, EDWARD, a painter of some note, was born at Wolverhampton, 12th April, 1772. Being bound apprentice to a maker of tea-trays at Birmingham, his artistic tendencies found some outlet in the ornamentation of these articles. He next took up art as a profession, without any regular training, and carried on a school of drawing at Bristol. In 1807 he exhibited some pictures at Bath, and had the good fortune to find purchasers for them. In 1809 he had a picture in the exhibition of the Royal Academy, and so successful was this work (the title was *Good News*) that his name at once became known. He was elected an associate of the Academy in 1812, and his reputation was increased by such paintings as the *Surrender of Calais*, the *Death of Eli*, and the *Field of Chevy Chase*—the last considered his greatest work. The *Death of Eli* was sold for five hundred guineas, and was awarded a premium of three hundred by the British Institution. In 1815 he became a full member of the Royal Academy, and he was also appointed court painter to Queen Charlotte. Among his last pictures were the *Crucifixion*, *Christ led to be Crucified*, the *Death of Ananias and Sapphira*, and the *Burning of Ridley and Latimer*. His talents, however, were considered to be rather for genre than for historic or sacred subjects.

BIRD, GOLDING, medical and scientific writer, was born at Downham, Norfolk, in 1814. After

receiving an education at a private school he was apprenticed to a London apothecary, whose pupil he was from 1829 to 1833. In 1832 he became a student of Guy's Hospital, where he took a distinguished position, and gained such a reputation, that when he went up for examination to the Apothecaries' Hall in 1836 he received the license to practise without any test of his qualifications being required. He now started as a medical practitioner in London, and also was appointed lecturer on natural philosophy at Guy's Hospital. In 1838 he took the degree of M.D. at St. Andrews, and in 1840 that of M.A. In the latter year he became a licentiate of the Royal College of Physicians, London, and in 1845 was elected a fellow. In 1843 he was appointed assistant physician at Guy's Hospital, where he also lectured on materia medica; and in 1847 he entered on a three years' course of lectures on the same subject at the College of Physicians. He took an active interest in natural history, chemistry, and other subjects more or less connected with medicine; and his multifarious occupations overtaxed his strength and undermined his health, so that he died at a comparatively early age on 27th October, 1854. He had by this time acquired a very large practice, and had made his name well known in his profession, more especially by his researches in scientific medicine. A work by which he was more generally known was his *Elements of Natural Philosophy*, which was for many years a text-book, and passed through a number of editions. A well-known work on *Urinary Deposits* was also published by him, as also *Lectures on Electricity and Galvanism in their Physiological and Therapeutical Relations*; *Lectures on Oxaluria*, &c.

BIRD, JOHN, mathematical instrument maker, was born in the county of Durham in 1709. He was originally a weaver, but changed his trade and set up in London about 1746 as a maker of scientific instruments, having previously received instructions from Graham (of the dead-beat escapement), the greatest mechanician of the time. In 1749 he received an order to construct a new brass mural quadrant of 8 feet radius for the Royal Observatory—a piece of work for which he received £300. This was used by Bradley and by Maskelyne, and continued serviceable for sixty-two years. Duplicates of it were soon ordered for St. Petersburg, Cadix, and the École Militaire, Paris—the last employed by D'Agelet and Lalande in determining the declinations of 50,000 stars. He also furnished Bradley with a new transit instrument and a 40-inch movable quadrant. Bird's marked superiority to all other makers of the day is strikingly exemplified by the fact that in 1767 the Board of Longitude paid him £500 on his agreeing to take an apprentice for seven years, instruct other persons as desired, and furnish upon oath descriptions and plates of his methods. A result of this arrangement was the publication of two treatises, named respectively *The Method of Dividing Astronomical Instruments* (1767), and *The Method of Constructing Mural Quadrants* (1768), each with a preface by Maskelyne, the astronomer-royal. Bird died on March 31, 1776.

BIRD, ROBERT MONTGOMERY, American novelist, was born at Newcastle, Delaware, in 1803. He qualified as a doctor, but soon gave up the practice of medicine for literature. He first became known as a dramatist, having written three tragedies—*The Gladiator*, *Oraloosa*, and *The Broker of Bogota*—all of which have taken a good place on the stage. His first novel was *Calavar* (1834), his second *The Infidel* (1835)—both of them having their scene in Mexico, at the time of the Spanish conquest. Then

followed the *Hawks of Hawk Hollow*, Sheppard Lee, and Nick of the Woods, or the Jibbenainosey (1837); the last probably the most popular of all his fictions. Its scene is laid in Kentucky soon after the close of the revolutionary war, and in it we have a lively picture of pioneer life at this date, and the relentless hostilities between the Indians and the early settlers. Peter Pilgrim, a collection of tales and sketches, and the *Adventures of Robin Day*, a novel, also proceeded from his pen. Dr. Bird died at Philadelphia, January 22, 1854, being then, and for some years previously, editor of the *North American Gazette*.

BIRD (or BYRD), WILLIAM, an English composer, born about 1538, was trained in music under Thomas Tallis, and was appointed organist of Lincoln about 1563. He became a gentleman of the Chapel Royal, London, in 1569, where subsequently he and Tallis held jointly the honorary post of organist. In 1575 the two composers obtained the monopoly for twenty-one years of printing and selling music and music paper; and on the death of Tallis in 1585 Bird became sole patentee. His first work of importance was *Psalms, Sonnets, and Songs of Sadness and Piety, Made into Music of Five Parts* (1588). In 1589 he published a collection of songs, and also a collection of sacred pieces for five voices; a second collection of similar pieces appeared also in 1591. In 1607 he published two books of 'Gradualia', being a collection of motets for the ecclesiastical year of the Roman Church; and in 1611 *Psalms, Songs, and Sonnets*. He died July 4, 1623. He continued all his life a Roman Catholic, but notwithstanding this he held a lease from the Crown of lands confiscated from a Catholic recusant, and never lost the appointment which he held in the Protestant Chapel Royal. Bird was the composer of the first English madrigal. He wrote a large number of pieces for the virginals, and also three masses. He was the author of a celebrated canon, 'Non nobis, Domine', often sung in England by way of grace after meat at public banquets.

BIRD-CATCHING, the art of taking birds or wild fowl. A common method of taking birds alive, more especially such as are to be kept in cages, is by means of twigs smeared with bird-lime. The instrument called a bird-call, which imitates the cry of a bird, may be used to entice them to the spot, or a call-bird or decoy-bird may be employed. Sometimes birds are caught by intoxication. The substance employed may be a mixture of the lees of wine and hemlock-juice, in which wheat is steeped, and afterwards scattered over the spot where the birds in question are known to resort: having eaten of the grain so treated, they soon become stupefied. Pheasants are often taken by night in a way not dissimilar, sulphur being burned under the trees on which they are observed to perch, in consequence of which they fall down in a stupefied condition. Another method of bird-catching is that by means of nets and call-birds, the nets employed being known as clap-nets, ingeniously contrived so as to fold over the birds by the pulling of a string. The common way of taking larks, of which so many are used for food, is at night, with large nets called trammels. These are drawn over the ground by two men, and every five or six steps the net is made to touch the ground, otherwise it would pass over the birds without touching them. When they are felt to fly up against the net, it is clapped down, and all are caught that are under it. In the depth of winter great numbers of larks are sometimes taken by nooses of horse-hair. None of these methods is attended with any danger; but fowling as practised among the rocks and precipices of Orkney, Shetland, the Færes, and other

northern islands and coasts, is a most hazardous occupation. There the precipices are sometimes several hundred feet in height, their faces roughened with shelves or ledges that appear sufficient only for the birds to rest and lay their eggs on. To these the dauntless fowlers will ascend, pass intrepidly from the one to the other, collect the eggs and birds, and descend with the same agility and indifference. In most places the attempt is made from above: the fowler being lowered from the slope contiguous to the brink by a rope. A fowler will even trust himself to a single assistant, who lets his companion down, and holds the rope, depending on his strength alone, or on the aid of a strong stake firmly fixed in the ground. The rope is often shifted from place to place, with the impending weight of the fowler and his booty of eggs and birds. In other cases several persons join together when catching birds in this manner, one person being let down, and the others managing the rope by which he is suspended. In some places the precipices are of such a height that a rope of 500 or 600 feet length may be required. A small line is also fastened round the body of the fowler, by which he gives signals that they may raise or lower him, or shift him from place to place. Where the birds nestle in deep recesses, or when the shelves on which their nests are situated are of considerable extent, the bird-catcher may disengage himself for a time from the rope, having attached the end of it to some convenient object. For the capture of water-fowl, see DECOY.

BIRD-CATCHING SPIDER, or BIRD SPIDER, a name applied to gigantic spiders of the genera *Mygale* and *Epeira*, which catch birds and suck their blood. The species to which the name was originally given was *Mygale avicularia*, a native of Surinam and other parts of tropical South America. The body of this insect is about two inches long, very hairy, and almost black; when the legs are stretched out it measures about a foot across. It lives in holes or crevices and does not spin a net proper, but makes a tubular nest for itself in which it lurks during the day, seeking its prey by night. Other species of *Mygale* belong to the Malay Archipelago, as *M. javanica* and *M. sumatrensis*. In experiments made with these spiders small birds have been known to die in a few seconds after being bitten. Some of the web-spinning spiders make webs strong enough to entangle small birds, which thus become their prey.

BIRD-CHERRY (*Prunus* or *Cerasus Padus*) a tree of the cherry genus, common in the British Islands, and in Scotland known also as the *hagberry*. It grows usually to the height of twenty or thirty feet, and is a very ornamental tree in shrubberies, from its purple bark, its terminal clusters or racemes of white flowers, and its fruits, which are successively green, red, and black. These are smaller than common cherries and have a disagreeable taste, but are greedily eaten by blackbirds, thrushes, and other birds. The wood is used by cabinet-makers, having an appearance resembling mahogany and taking on a good polish.

BIRD-LICE, a name popularly given to a number of wingless insects parasitic on birds, and belonging to a group designated Mallophaga. This group is composed of several families, many genera, and hundreds of species of minute insects. 'Every species of bird or beast has one or more kinds of these pests upon some one or other of the regions of its body, while, in a few cases, a single species of bird is known to harbour as many as four or five kinds of these parasites. As all of these forms are provided with jaws, they gnaw the tender cuticle at the base of the hair or feathers, cause intolerable irritation, and

by reason of their great numbers produce wasting disorders, or even cause the death of the creatures upon which they congregate.' Canaries and other cage-birds, pigeons, &c., often suffer greatly from these insects.

BIRD-LIME, a viscous substance used for entangling small birds so as to make them easily caught, twigs being for this purpose smeared with it at places where the birds resort or to which they are attracted by a call-bird. It is usually prepared from the middle bark of the holly, which is stripped off in June or July, boiled in water for six or eight hours, and the water being strained off, is then left to ferment. This process may take two or three weeks, during which it is watered if necessary. At the end of this time it assumes a mucilaginous form, and after being pounded in a mortar and worked with the hands in water, it is fit for being used. This substance, when prepared, is of a greenish colour and very tenacious. Mice are sometimes caught with it as well as birds.

BIRD OF PARADISE. See PARADISE (BIRD OF).

BIRDS. See ORNITHOLOGY.

BIRD'S-EYE VIEW. See PERSPECTIVE.

BIRD'S FOOT, a common name for several plants, especially for leguminous or papilionaceous plants of the genus *Ornithopus*, the name being given from the appearance of the legumes, which are articulated, cylindrical, and bent like a bird's claw. *O. perpusillus* is a well known British plant, growing in dry, sandy situations.

BIRD'S-FOOT TREFOIL, the popular name of *Lotus corniculatus*, and one or two other creeping leguminous plants common in Britain. *L. corniculatus* is a well-known prostrate perennial, growing on open grassy pastures and dry places. Its stems are slightly hairy, from three to ten inches long, arising from deeply-fixed woody roots. The leaves are trifoliate, smooth, glaucous, with large ovate leafy stipules. The flowers are bright yellow, in clusters of from two to five, nearly sessile, at the end of an erect slender peduncle. The pods are purplish brown, long, and slender. It furnishes cattle with an agreeable food, its nutritious qualities being probably equal to those of clover. *L. major* is much larger than the preceding, has the flowers growing eight or twelve together, and is found in wet places.

BIRD'S NEST, a name popularly given to several plants: as (1) to *Neottia nidusavis*, a British orchid found growing in beech-woods, this plant being so called on account of the mass of stout interlaced fibres that form its roots; (2) to *Monotropa hypopitys*, a parasitic plant of the heath family, growing on the roots of trees in fir-woods, and having leafless stalks massed together to resemble a nest built of sticks; (3) to the fern *Asplenium nidus*, from the manner in which the fronds grow, leaving a nestlike hollow in the centre.

BIRDS' NESTS, EDIBLE, the nests of the salangane (*Collopalia fusiphaga*) and other species of swifts or swiftlets, found in the Malay Archipelago, and used as an article of luxury among the Chinese. They are particularly abundant in Sumatra and Borneo, especially near the north end of the island. The nest has the shape of a common swallow's nest, is about the size of a half teacup, is found in caves, particularly in sea-cliffs, and has the appearance of fibrous gelatine or isinglass. They appear to be composed of a mucilaginous substance secreted by special glands, and are not as was formerly thought made from a glutinous marine fucus or seaweed. The finest nests at present are said to fetch so high a price as fifty shillings a pound. £15,000 or

£20,000 worth are said to be sent to Singapore and China annually. They are bought almost exclusively by the rich Chinese, who consider them a great stimulant and tonic, and are used in making soup. The finest are those obtained before the nest has been contaminated by the young birds; they are pure white, and are comparatively scarce. The inferior ones are dark, streaked with blood, or mixed with feathers: they are chiefly converted into glue. Some of the caverns in which these nests are built are difficult of access and dangerous to climb, so that none can collect the nests but persons brought up to the trade. The following account of the traffic in these birds' nests we extract from Mr. Crawford's excellent work on the Eastern Archipelago:— 'The best nests are those obtained in deep, damp caves, and such as are taken before the birds have laid their eggs. . . . They are taken twice a year, and if regularly collected, and no unusual injury be offered to the caverns, will produce very equally, the quantity being very little, if at all, improved by the caves being left altogether unmolested for a year or two. Some of the caverns are extremely difficult of access, and the nests can only be collected by persons accustomed from their youth to the office. The most remarkable and productive caves in Java, of which I superintended a moiety of the collection for several years, are those of Karang-bolang, in the province of Baglen, on the S. coast of the island. Here the caves are only to be approached by a perpendicular descent of many hundred feet by ladders of bamboo and rattan over a sea rolling violently against the rocks. When the mouth of the cavern is attained, the perilous office of taking the nests must often be performed with torchlight, by penetrating into recesses of the rock, where the slightest trip would be instantly fatal to the adventurers, who see nothing below them but the turbulent surf making its way into the chasms of the rock. The only preparation which the birds' nests undergo is that of simple drying, without direct exposure to the sun, after which they are packed in small boxes, usually of half a picul. . . . They are consumed only by the great; and indeed the best part is sent to the capital for the consumption of the court. The sensual Chinese use them under the imagination that they are powerfully stimulating and tonic; but it is probable that their most valuable quality is their being perfectly harmless. The people of Japan, who so much resemble the Chinese in many of their habits, have no taste for the edible nests; and how the latter acquired a taste for this foreign commodity is no less singular than their persevering in it.'

BIRDS OF PASSAGE, birds which migrate with the season, from a colder to a warmer or from a warmer to a colder climate, being divided into summer birds of passage and winter birds of passage, according as they visit a country in summer or in winter. Such birds always breed in the country to which they resort in summer, that is in the colder of their homes. Among British summer birds of passage are the cuckoo, swallow, &c., which depart in autumn to spend the winter in a warmer climate, but return in spring to breed in Britain; while in winter woodcocks, field-fares, &c., flock to Britain from more northerly regions, whither they return in spring to breed out their young. See **MIGRATION OF ANIMALS**.

BIRDS OF PREY. See **RAPTORES**.

BIREDJIK, or **BIREIK**. See **BIR**.

BIREN, or **BIRON**, **ERNEST JOHN VON**, Duke of Courland, born in 1687, was the grandson of a groom of James, duke of Courland, and the son of a Courland proprietor of the name of Bühren. He

studied at Königsberg. His agreeable person and very cultivated mind procured him the highest favour of Anna, duchess of Courland, and niece of Peter the Great of Russia; but he was unsuccessful in his attempt to obtain admission among the Courland nobility. When Anna ascended the Russian throne (1730), Biren, in spite of the conditions to which the empress had consented (one of which was not to bring him with her to Russia), was loaded by her with honours, and introduced at the Russian court. Here he assumed the name and coat of arms of the Dukes of Biron in France, and governed under the name of his mistress. Fierce and haughty by nature, he indulged his hatred against the rivals of his ambition. The Princes Dolgoroucky were his first victims. He caused 11,000 persons to be put to death, and double that number to be exiled. It is said that the empress often threw herself at his feet to induce him to lay aside his severity, but that neither her entreaties nor her tears were able to move him. The firmness of his character, however, introduced vigour and activity into all branches of the administration throughout the great empire. In 1737 Anna forced the Courlanders to choose her favourite (who had in 1722 married a Courland lady) for their duke. After having declared Prince Ivan her successor, she appointed Biren, according to his wish, regent. Anna died, Oct. 28, 1740. The new regent acted with prudence and moderation. But a secret conspiracy was soon formed against him. Field-marshal Münich, with the consent of the young emperor's mother, caused him to be arrested in his bed during the night of Nov. 19, 1740, by Manstein, and to be confined in the Castle of Schlusselfburg. He was subjected to a trial; but no proofs of the projects which he was accused of having formed for the advantage of his family being discovered, the sentence of death was changed into that of imprisonment for life, and his fortune was declared confiscated. Together with his family he was transported to Pelym, in Siberia, and thrown into a prison, of which Münich himself had furnished the plan. In the following year Elizabeth, daughter of Peter the Great, being raised to the Russian throne by a new revolution, Biren was recalled, Dec. 20, 1741, and Münich was obliged to occupy his prison. At Kasan the sledges met; the travellers recognized each other, and proceeded on their way without interchanging a word. Biren was detained in a sort of modified imprisonment at Jaroslavl, and only received his full liberty in 1762 from Peter III. When Catherine II. ascended the throne the Duchy of Courland was restored to Biren in 1763. He governed with wisdom and lenity, transferred the government to his eldest son, Peter, and closed his restless life, 28 Dec., 1772.

BIRETTA, a term of Italian origin, designating a kind of cap worn by ecclesiastics, especially those of the Roman Church, though some ritualistic clergymen of the Anglican Church also wear it. It is of considerable antiquity, though it has varied in shape and material at different times. It is at present a stiff-sided, square-shaped cap with sharp edges, a flattened top surmounted by ridges rising above it, and having in the centre a sort of tuft or tassel. It is made of cloth or stuff, the colour being black for priests, purple or violet for bishops, and scarlet for cardinals.

BIRKBECK, **GEORGE**, originator of mechanics' institutes, was born at Settle, Yorkshire, 10th Jan. 1776; his father being a banker and merchant there. He studied medicine at Edinburgh, and took the degree of M.D. there in 1799, among his friends and fellow-students being Brougham and Jeffrey. Being appointed to the chair of natural and experimental philosophy in the Andersonian University at

Glasgow, in 1799 he delivered his first course of lectures. The following year he began to give gratuitous lectures to mechanics, which were soon largely attended. This was the first attempt to establish mechanics' institutes, and to Dr. Birkbeck the honour of being their founder belongs. The Glasgow Mechanics' Institution, though it was not established till 1823, owed its origin to these lectures delivered by him. In 1804 he settled as a physician in London, and was soon engaged in an extensive practice; but the extension of scientific knowledge to mechanics was ever present to his thoughts, and in 1824 he had the happiness of being elected president of the London Mechanics' Institution, for which that at Glasgow had led the way. Similar institutions were soon after rising up and prospering in all the larger towns of the kingdom. Dr. Birkbeck was also connected with the founding of University College, London, advocated the repeal of the tax on newspapers, and was active as a lecturer and promoter of various educational movements. The London Mechanics' Institution still exists, but it is now known as the Birkbeck Literary and Scientific Institution. Dr. Birkbeck died on the 1st Dec., 1841.

BIRKENFELD, a small German principality belonging to the grand duchy of Oldenburg, from which, however, it is a long way off, being situated in the south of and entirely surrounded by Rhenish Prussia. It is a hilly and well-wooded district; area, 200 square miles; pop. (1895), 42,248. It contains the small town of Birkenfeld, pop. about 2500.

BIRKENHEAD, a parliamentary, county, and municipal borough of England, in western Cheshire, on the estuary of the Mersey, opposite to Liverpool. It has risen up and grown to a large town with great rapidity. It owes its prosperity to the same causes that have made Liverpool a great seaport, and it may be regarded as really a suburb of that city. Its growth began with the erection of its commodious docks, which now have a lineal quay space of over 9 miles, and along which is a complete system of railway communication for the shipment of goods and direct coaling of steamers. It has its principal streets, running from N.W. to S.E., crossed at right angles by a number of shorter ones; a handsome square, having an area of 6½ acres, 4 of which are inclosed and planted with shrubbery; a new town-hall; a new sessions court, and police courts; market which cost £30,000; slaughter-houses on the most approved plan; public baths; and ranges of dwelling-houses for workmen, unusually complete in their accommodation and in all their appointments. The system of drainage and sewerage is also singularly complete. The width of courts is regulated, and the chief streets are generally wider than in the best parts of most towns. There is here a theological college of the Church of England (St. Aidan's) where young men are prepared as clergymen; a free public library, schools of art, &c. The benevolent institutions comprise an infirmary, children's and lying-in hospitals, and a dispensary. In the N.W. part of the township, on rising ground, a large public park (114 acres), beautifully laid out, has been formed, having a noble carriage entrance in the Ionic style. There is also another and smaller public park. Its magnificent docks, however, which belong to the splendid Liverpool system, form the great distinguishing feature of Birkenhead. The dock warehouses are on an equally magnificent scale. The Mersey tunnel, 4½ miles long including the approaches, 21 feet high, and 26 feet wide, and which cost £1,250,000, now connects Liverpool with Birkenhead. Communication with Liverpool is also kept up by a fleet of fine large steamboats for passengers and ordinary luggage traffic, which ply from each side of the river. There

is also special and separate steamboat accommodation for goods and wheeled vehicles. The right of ferryage across the Mersey at this point was vested by special charters granted by Edward I. and Edward II. in the Prior of Birkenhead and his successors for ever, and the ruins of the ancient priory still exist in a good state of preservation, and adjoin the present church and vicarage of St. Mary. The priory (Benedictine) was founded here in 1153. The ferries are now the exclusive property of the corporation, and produce an important revenue to the town. The corporation are also the owners of the gas, water, and electric lighting undertakings. The water-supply, which is abundant and of excellent quality, is obtained within the borough by pumping from the red sandstone strata which underlies it. The water is forced into the water-towers built on the heights of the town, and from thence is distributed to the inhabitants by gravitation in the usual way. The shipping returns of Birkenhead are included in those of the port of Liverpool. Birkenhead has gained a distinguished name for ship-building, especially in connection with vessels turned out by Messrs. Laird. There are works in connection with machinery and engineering, wagon-works, flour-mills, oil-cake mills, &c. The corporation owns all the tramway lines of the town. Birkenhead has returned a member to Parliament since 1861. It received a charter of incorporation as a municipal borough in 1877. Pop. in 1821, 236; in 1851, 51,649; in 1871, 65,980; in 1881, 84,002; in 1891, 99,867; in 1901, 110,926.

BIRMAH. See **BIRMA**.

BIRMINGHAM, one of the greatest manufacturing cities in England, situated on the small river Rea, near its confluence with the Tame, an affluent of the Trent, in the north-west extremity of the county of Warwick, 112 miles north-west from London, stands nearly in the centre of England, on elevated ground, having an ascent on all sides but the north-west. The lower part of the city, consisting chiefly of old houses, is crowded with workshops and warehouses, and inhabited principally by the working classes; but the upper part contains a number of new, broad, and regular streets. Among the public buildings, the town-hall, built of Anglesey marble in 1832, and erected for municipal purposes, public meetings, and musical performances, holds the first place. It is a rectangular building, after the model of the temple of Jupiter Stator at Rome. It rests on a rustic basement of 20 feet in height, pierced with doors and windows, and is surrounded by a series of Corinthian columns supporting entablatures above. The large saloon or hall is 145 feet long, 65 wide, and 65 high. It can accommodate about 2500 persons sitting, and contains a magnificent organ. In this hall a great musical festival is held once every three years, the proceeds of which go to the support of the General Hospital. It was at the Birmingham Festival of 1846 that Mendelssohn's oratorio 'Elijah' was first performed. Among the other public buildings of note are the council-house or municipal buildings for the accommodation of the different corporation offices, erected in 1874-78 (cost £200,000), the new law-courts, opened 1891, the new General Hospital (1897), municipal technical school, opened 1895 (cost £288,000), Bingley Hall, bankruptcy court, four theatres, the new post office, the corporation baths, the gun-proof office, the stations of the London and North-Western, Great Western, and Midland Railway companies, the Great Western Hotel, the Grand Hotel, the cavalry barracks, the Birmingham or old library, founded in 1779, rebuilt on a new site in 1899, the Exchange buildings, in which are the rooms belonging to the Chamber of Commerce, established in 1813, the county court buildings, public dining-halls, several

clubs, a public gallery of art, for which a new building adjoining the council-house has been erected, the Birmingham and Midland Institute, corn exchange, masonic hall, market-hall, fish-market, and three arcades, besides churches, chapels, and numerous charitable and educational institutions. The public statues include Queen Victoria, Prince Albert, James Watt, Thomas Attwood, Joseph Sturge, Sir Robert Peel, Lord Nelson, Dr. Priestley, Rowland Hill, George Dawson, Sir Josiah Mason, &c. The statue of Lord Nelson is a bronze one of colossal size, erected in an open space called the Bull Ring. Among the numerous churches and places of worship are some handsome and elegant structures. The mother church of Birmingham is that of St. Martin's, or the Old Church, the register of which dates from the year 1544. This church was rebuilt in 1875 at a cost of £30,000. St. Philip's is the second parish church of Birmingham (built in 1711, restored in 1868, chancel added 1884). It stands on the highest ground, and in the very centre of the city. Both this church and St. Martin's contain fine stained-glass windows, designed by Sir E. Burne-Jones, who was a native of Birmingham. One of the most remarkable of the Birmingham churches is the Roman Catholic cathedral of St. Chad, a noble Gothic structure designed by Pugin, richly adorned with stained-glass windows, and containing some interesting antiquities, among which are the pulpit, an elaborate carving in oak of the sixteenth century, and an episcopal throne and stalls on a brass lantern, all of the fifteenth century. In 1899 Christ Church (which occupied an important site at the top of New Street) was pulled down, and the site sold for £78,000. The money is to be applied to the erection of churches in the suburbs. Among the charitable institutions the most important are the General Hospital, commenced in 1760, opened in 1779, and rebuilt in Steelhouse Lane in 1897 (it has a 'Jaffray' branch for convalescents); the Queen's Hospital, founded in 1840, and incorporated as a clinical hospital by special act of Parliament, Aug. 12, 1867; the Birmingham and Midland Free Hospital for Children, founded in 1867; the Birmingham and Midland Eye Hospital, first established in 1823; the Women's Hospital; Ear and Throat Hospital; Orthopædic and Spinal Hospital; Skin and Lock Hospital; Dental Hospital, &c. The principal educational institution is the Birmingham University, incorporated by royal charter in 1900. This has grown out of Mason University College, founded by the wealthy manufacturer, Sir Josiah Mason, in 1875, and opened in 1880. A large fund for the further endowment of the Mason College was latterly raised, and in virtue of an act of parliament this fine institution has been merged into the new university for Birmingham and the Midlands, for the due equipment and establishment of which an additional sum of about £400,000 was provided by subscription. The university has faculties of arts, science, medicine, and commerce. There are also a Roman Catholic college at Oscott; Saltley diocesan training college; the Free Grammar School, founded by Edward VI., which has a central or high school in New Street, with five branch schools in different parts of the town; Wesleyan Theological College; the Blue Coat School; the Protestant Dissenters' Charity School (for maintaining and educating poor girls for domestic service); the government school of art and design; industrial schools and numerous board schools. Birmingham was one of the first towns in England to adopt the Elementary Education Act of 1870, and primary education is under the supervision of the school-board. In addition to the Birmingham or old library already mentioned, there is a free library having a total of about 250,000

volumes, with those in nine branches through the city. The Shakespeare Library contains over 10,000 volumes, and occupies an exquisitely designed annex of the Free Reference Library. The city now possesses seven public parks, none of them large, and several recreation grounds. In Aston Park, on the north of the city, stands the fine old mansion of the Holte family—Aston Hall, erected in 1635, and purchased by the corporation in 1884.

The prosperity of Birmingham is wholly attributable to the excellence, variety, and extent of its hardware manufactures. Its geographically central situation on the border of the great South Staffordshire coal and iron district, combined with the command of a wide and ready transit, both by canal and railway—of which means of transit it may be considered the great centre for the kingdom—have contributed to render it the emporium from which a large surrounding district is supplied, and likewise one of the greatest manufacturing towns in the particular line above alluded to in the world—approached only, perhaps, by Sheffield. There is an extensive system of tramways, the 'cable tramway' which runs to the suburb of Handsworth being especially successful. At Soho, in the vicinity of the city, was formerly one of the largest steam-engine manufactories in the world, belonging to Boulton, partner of the celebrated James Watt. The Soho works were founded in 1757, and came into the possession of Matthew Boulton in 1762. Not a vestige of the building now remains. One of the most important manufactures is that of firearms. The number of gun-barrels tested in some recent years has amounted to between 500,000 and 600,000. The manufacture of swords is also one of the staple trades. Cast-iron articles of all kinds, and of the most beautiful patterns and workmanship, are manufactured at Birmingham to a great extent. In former years iron-founding was limited to large and heavy articles, but is now extended, with the most entire success, to the lightest and most graceful, in the finishing of which bronze is now very generally employed. Since the introduction of railways the manufacture of railway wagons and carriages has been very extensively developed. The quantity of solid gold and silver plate manufactured is large, and the consumption of silver in plating is very great. The beautiful invention of electro-plating, first practised in this town in 1840, tends very greatly to the increase of the consumption of silver and also of gold. The vast establishment of Elkington & Co., Newhall Street, is an object of great attraction. The jewellers' quarter of the town is in the neighbourhood of St. Paul's and St. George's churches. Japanning, in all its forms and varieties, is carried on here to a large extent. Brass-founding and the casting of brass articles is a very important local industry. Glass manufacturing, and glass staining or painting, forms another important branch of manufacture. There are also large chemical works for vitriol, sal-ammoniac, cobalt, and other substances. The making of steel pens is another important branch of the trade of Birmingham—hundreds of millions being manufactured annually. Pins are also manufactured to a great extent. Fancy seals, brooches, clasps, and other trinkets, composed of what is called Birmingham gold, and polished steel, are made in immense quantities, of the most beautiful workmanship, and at prices which excite astonishment. Of late years the manufacture of bicycles has been taken up, and more machines are now made annually in Birmingham than in any other town. The above sketch gives only a selection of a few of the leading articles manufactured at this great seat of human industry and ingenuity. The machinery employed in the manu-

facture of nails, screws, button shanks, &c., and in rolling out thick bars or ingots of metal into long thin sheets, are amongst the most wonderful inventions of the mechanical genius of this extraordinary place; all of these combining prodigious power with the most delicate and beautiful precision of movement. Though many large capitalists are engaged in the manufactures of Birmingham, large numbers average only from £500 to £1000. These persons give out their work to the workmen they employ, who are generally paid by the piece and work at home. The employer has thus no expensive establishment to maintain, and no wages to pay but when he has orders to execute. The workman, again, when the work put into his hands requires the aid of machinery, may hire, for any given time, one or more rooms, together with a certain quantity of steam-power, in any one of a number of buildings appropriated to such purposes, which are furnished with steam-engine, working-shafts, lathes, benches, &c.

By the Reform Act of 1832 Birmingham was constituted a borough, sending two members to Parliament. The act of 1867 gave it a third, while that of 1885 added four others and divided the borough into seven parliamentary districts. In 1888 it was raised by Order in Council to the rank of a city, and by the Local Government Act of that year it also became a county borough. In 1891 the boundaries of the borough were extended, and its area is now 12,705 acres, comprising the parishes of Birmingham and Edgbaston, and parts of others. The borough is divided into eighteen wards; the mayor is now 'Lord' Mayor. The municipal and parliamentary boundaries are the same, the parliamentary divisions being North, South, East, West, Central, Bordesley, and Edgbaston. A great scheme to bring water from the Eilan Valley in Wales, a distance of 80 miles, is now in progress, and its completion (at a cost of about six millions sterling) is looked for in about 1904. The corporation of Birmingham has long been recognized as in the forefront of British municipalities, a reputation which it largely owes to the splendid work done by the Rt. Hon. Joseph Chamberlain (three times mayor). The corporation purchased the gas-works and the water-works in 1875, and the Electric Company's rights in 1898. In 1876 an 'Improvement Act' was obtained, by which, at a cost of about two millions sterling, a large area of insanitary property in the very centre of the city was cleared away, and a magnificent new street—Corporation Street—laid out on the site thereof. Mr. Chamberlain's work has been commemorated by a handsome fountain which stands at the back of the town-hall.

The city of Birmingham is supposed originally to have been a small Roman station on the Icknield Street, a Roman road of which an original portion is still plainly visible in the green expanse of Sutton Park, on the north of the city. It is known to have existed in the reign of Alfred in 872, and is mentioned in the Domesday Book (1086) by the name of *Bermingeham*. Another old name of the town is *Bromwycheam*, a form still preserved very nearly in the popular local pronunciation *Brummagem*. Of the early history of the city very little is known. It was the centre of the Saxon kingdom of Mercia; and at the time of the Conquest was a place of some consideration. Leland (in Camden's *Britannia*), writing in 1538, mentions that there were 'many smithies' there, indicating that it was even then a place of some industrial importance. Birmingham was distinguished in the cause of the Parliament, and was the scene of some conflicts, in the last of which, in 1648, it suffered considerably, having been taken and partially burned by Prince Rupert, who inflicted a heavy fine on the inhabitants. It suffered

to a fearful extent from the plague in 1665. Its first considerable increase in size and population took place in the reign of Charles II. Toward the middle of the eighteenth century it began to assume an important appearance, and it has since continued rapidly to increase. The American and French wars during the latter part of the eighteenth century and the early part of the nineteenth were the great causes of its prosperity and increase, by the great demand which they caused for muskets. The manufacturers of arms were kept exceedingly busy for some years, and muskets for the troops were supplied for a time at the rate of about 15,000 weekly, not less than about 5,000,000 in all being manufactured here during this stirring period. In July, 1791, Birmingham was the scene of a series of disgraceful riots, the rabble being inflamed against reputed partisans of revolutionary principles; property was destroyed—including Dr. Priestley's house to the amount of £60,000. In 1839 riots again took place in the Bull Ring, when several private buildings in the neighbourhood were set on fire, and various other excesses committed. The 'Murphy Riots' of 1866 closed this series of disorders. The general healthiness of Birmingham is deserving of notice, for which it is probably indebted to the larger quantity of open space which it possesses, when compared with such towns as Manchester and Liverpool; the general excellence of its drainage, greatly facilitated by the substratum of sand and gravel (belonging to the geological formation entitled the New Red Sandstone or 'Trias') on which it is built; and the circumstance that there is scarcely an underground dwelling, or what is called a cellar, within its precincts. In 1698 the birth-rate was 83·9, and the death-rate 20·4 per 1000. In 1801 the pop of Birmingham was 73,670; in 1871, 343,787; in 1881, 400,774; in 1891, 478,113; and in 1901, 522,182.

BIRON, CHARLES DE GONTAUT, DUC DE, son of Marshal Armand de Gontaut, Baron Biron, was born about 1662. He served Henry IV. in the field with much zeal and courage, was raised to the rank of Admiral of France in 1692, and in 1698 was made a peer and duke. He thought himself, however, not sufficiently rewarded, and began to intrigue with the Spanish party against the king. In 1699 he concluded an agreement with the Duke of Savoy and the Count of Fuentes, by which he pledged himself to take up arms against his benefactor. Meanwhile, war being declared against the Duke of Savoy (1600), Biron saw himself reduced to the necessity of attacking him. He still continued his negotiations with the enemy, however, and at last they became known to the king, who interrogated the marshal as to his designs, with promises of pardon. Biron made a partial confession, and continued his intrigues as before. Notwithstanding this, Henry sent him in 1601, after the conclusion of peace with Savoy, as envoy to Queen Elizabeth of England. In the meantime Biron's confidant, Lafin, having become suspected by the Count of Fuentes, and beginning to fear for himself, discovered the whole plot. A frank confession and repentance would even then have saved Biron, since Henry was inclined to forgive him. He, however, persevered in his denial, rejected the offers of pardon, and was therefore, at the urgent entreaties of the queen, at last surrendered to the rigour of the laws. He was tried before the Parliament, and was beheaded on July 31, 1602.

BIRON, ERNEST JOHN. See BIREN.

BIRR. See PARSONSTOWN.

BIRTH, or LABOUR, in physiology, is the act by which a female of the class Mammalia brings one of her own species into the world. When the fetus has remained its due time in the womb, and is in a condition to carry on a separate existence, it is ex-

truded from its place of confinement, in order to live the life which belongs to its species, independently of the mother. The womb having reached its maximum of growth with the increasing size of the fœtus, its peculiar irritability excites in it the power of contraction; it thereby narrows the space within, and pushes out the mature fœtus. The period of gestation is very different in different animals, but in each particular species it is fixed with much precision. In the womb the corporeal frame of man commences existence as an embryo; after further development, appears as a fœtus; then as an immature, and finally a mature, child. With its growth and increasing size, the membranes which envelop it enlarge, the womb also expanding to give room for it. At the end of the thirty-ninth or the beginning of the fortieth week, the child has reached its perfect state, and is capable of living separate from the mother; hence follows in course its separation from her, that is, the birth.

Contractions of the womb gradually come on, which are called, from the painful sensations accompanying them, *labour-pains*. These are of two kinds: first, the preliminary pangs, which begin the labour, do not last long, are not violent, and produce the feeling of a disagreeable straining or pressure. When the pregnant female is attacked by these, she is often unable to move from her place till the pang is over, after which she is often free from pain for some hours. Then follow the true labour-pains; these always last longer, return sooner, and are more violent. The contractions of the womb take place in the same order as the enlargement had previously done, the upper part of it first contracting, while the mouth of the womb enlarges, and grows thin, and the vagina becomes loose and distensible. By this means the fœtus, as the space within the womb is gradually narrowed, descends with a turning motion towards the opening; the fluid contained in the membranes enveloping the fœtus, as the part making the greatest resistance, is forced out, and forms a bladder, which contributes much to the gradual enlargement of the opening of the womb. It is therefore injurious to delivery, if hasty or ignorant midwives break the membranes too soon. By repeated and violent throes the membranes at length burst, and discharge their contents, and some time after the head of the child appears. As the skull-bones have not yet acquired their perfect form and substance, but are attached at the crown of the head only by a strong membrane, and may be brought nearer together, the head, by the pressure which it undergoes, may be somewhat diminished in size, and squeezed into a more oblong form, so as to pass through the opening of the matrix and the pelvis in which it is contained, and, finally, through the external parts of generation; and when this is done, the rest of the body soon follows.

The act of birth or delivery is accordingly, in general, not an unnatural, dangerous, and diseased state of the system, as many timid women imagine. It is a natural process of development, which is no more a disease than the cutting of the teeth, or the coming on of puberty, although, like them, it may give rise to important changes in the body, and to various diseases. It is true that the process of childbirth requires a violent exertion of nature, but this is facilitated by many preparatives and helps adapted to the purpose. If the birth succeeds in the way described, it is called a *natural birth*. For this it is requisite that the pelvis should be properly formed, and that the opening should permit a free passage to the perfect fœtus; that the growth and size of the fœtus should be proportioned to the pelvis, especially that the head should have the size designed by

nature, proportioned to the diameter of the pelvis; also, that there should be a proper situation of the womb, in regard to the axis of the pelvis, and a proper position of the fœtus, namely, the head down, the back of the head in front, and towards the opening of the womb, so as to appear first at birth; and, finally, that the external parts of generation should be in a natural state.

An easy birth takes place without any excessive strainings, and in due season. A difficult birth proceeds naturally, but is joined with great efforts and pangs, and occupies a long time—over six or eight hours. The cause of it is sometimes the stiffness of the fibres of the mother, her advanced years, the disproportionate size of the child's head, and various other causes. Nature, however, finishes even these births; and women in labour ought not to be immediately dejected and impatient, on account of these difficulties. An *unnatural* (or properly an *irregular*) birth is one in which one or more of the above-mentioned requisites to a natural birth are wanting. An *artificial* birth is that which is accomplished by the help of art, with instruments or the hands of the attendant. *Premature* birth is one which happens some weeks before the usual time, namely, after the seventh, and before the end of the ninth month. Though nature has assigned the period of forty weeks for the full maturing of the fœtus, it sometimes attains, some weeks before this period has elapsed, such a growth that it may be preserved alive, in some cases, after its separation from the mother. That it has not reached its mature state is determined by various indications. Such a child, for instance, does not cry like full-grown infants, but only utters a faint sound, sleeps constantly, and must be kept constantly warm, otherwise its hands and feet immediately become chilled. Besides this, in a premature child, more or less, according as it is more or less premature, the skin over the whole body is red, often indeed blue, covered with a fine, long, woolly hair, especially on the sides of the face, and on the back; the fontanel of the head is large, the skull-bones easily moved; the face looks old and wrinkled; the eyes are generally closed; the nails on the fingers and toes short, tender, and soft, hardly a line in length; the weight of such a child is under six, often under five pounds. The birth is called *untimely* when the fœtus is separated from the womb before the seventh month. Such children can be rarely kept alive; there are instances, however, of five months' children living. A curious remark is found in good writers, that a seven months' child is more likely to live than one born a month later.

Late birth is a birth after the usual period of forty weeks. As this reckoning of the time of pregnancy to birth is founded for the most part solely on the evidence of the mother, there is much room for mistake or deception. The question is one of much interest in medical jurisprudence, as the inquiry often arises whether a child born more than forty weeks after the death of the reputed father is to be considered legitimate or not. The importance of the question, and the uncertainty of the proof, have occasioned a great variety of opinions among medical writers. Most of them doubt the truth of the mother's assertions about such a delayed birth, and give, as their reason, that nature confines herself to the fixed period of pregnancy; that grief, sickness, &c., cannot hinder the growth of the fœtus, &c. Others maintain, on the contrary, that nature binds herself to no fixed rules; that various causes may delay the growth of the child, &c.

Abortion and miscarriage take place when a fœtus is brought forth so immature that it cannot live.

They happen from the beginning of pregnancy to the seventh month, but most frequently in the third month. The occasions, especially in those of a susceptible or sanguine temperament, are violent shocks of body or mind by blows, falling, dancing, cramp, passion, &c.

BISCAY (Spanish *Vizcaya*), also called **BILBAO**, a province of Spain, forming one of the three Basque provinces (Provincias Vascongadas), the other two being Alava and Guipuzcoa. It lies near the N.E. corner of Spain, between the Bay of Biscay and the provinces of Santander, Burgos, Alava, and Guipuzcoa. The area is 850 square miles; the pop. 188,998. The surface is generally mountainous; the principal river is the Nervion or Ibaizabal. In point of soil and natural productions Biscay is one of the least favoured provinces of Spain; but the industry of the inhabitants has been successfully exerted in converting naturally barren tracts into fruitful fields and verdant pastures. The chief crops are maize and barley. Many fine fruits, especially nectarines, are raised; walnuts and chestnuts everywhere abound, and form a considerable export to England and Germany. The cattle are of a small and inferior breed; and the rearing of sheep for wool is rendered difficult by the brushwood which covers great part of the mountain districts, and tears and destroys the fleeces. Fish abound along the coast, and give occupation to a great number of fishing-boats. The principal species taken are bream, tunny, cod, and anchovies. The most important mineral is iron, which is found of excellent quality throughout the province, and is extensively worked. Lead, copper, and zinc also occur. The inhabitants of Biscay, who are called Basques (see **BASQUE**), are brave, active, and industrious. They inhabit not only Biscay and the other two Basque provinces strictly so called, but also the province of Navarre, and are estimated to amount in number to 650,000. The capital of Biscay is Bilbao; of Guipuzcoa, St. Sebastian; of Alava, Vittoria; of Navarre, Pampeluna. The general character of these provinces resembles that of the province of Biscay. The Basque country long formed a kind of state distinct from the rest of Spain, governed according to its own ancient laws and usages.

BISCAY, BAY OF, that part of the Atlantic which lies N. of the province of Biscay, between the projecting coasts of France and Spain, extending from Ushant to Cape Finisterre.

BISCAY, NEW. See **DURANGO**.

BISCEGLIE, a sea-port town, kingdom of Italy, province of Bari, 13 miles S.E. of Barletta, on a rock, W. shore of the Adriatic, surrounded by walls, and in general badly built. It has a cathedral, two collegiate and several other churches, convents of both sexes, a seminary, hospital, and a *mont-de-piété*. The port admits vessels of small burden only. The town being almost destitute of water, rain is collected in large cisterns cut in the solid rock. The neighbourhood produces good wine. Important fairs are held here twice a year. Pop. in 1831, 21,765.

BISCHOFSWERDER, JOHANN RUDOLPH VON, a Prussian general and minister, born in Saxony about 1737, entered the University of Halle in 1756, was admitted into the Prussian service in 1760, and appointed major in 1779. Under Frederick William II. he exercised an unlimited influence at the court of Berlin. The attachment which he had shown Frederick William while yet crown-prince procured him the lasting affection of this short-sighted and prodigal monarch. As plenipotentiary he took a great part in the congress at Sistova. He afterwards effected the interview with Lord Elgin at Pillnitz. After the king's death he was dismissed, and died at

his country-seat in the neighbourhood of Berlin, 1803. His views as a statesman and a man were very limited. His propensity to mysticism had consequences in the highest degree injurious. He belonged to the society of the Illuminati.

BISCHWEILER, a town in Germany, in the imperial territory of Elsass-Lothringen (Alsace-Lorraine), 12 miles N. of Strasburg, on the right bank of the Moder. It was formerly an episcopal town, and defended by a castle erected in the fifteenth century, but dismantled in 1706. It has manufactures of cloth for the army, ticks, linen, woollen gloves, knitted articles, oil, and pottery; besides bleachfields, spinning-mills, breweries, tanneries, madder-mills, and iron mines. Its trade is in wine, hops, hemp, tobacco, madder, coal, cattle, &c. Pop. (1895), 7304.

BISCUIT, compounded of two words meaning *twice baked*, is applied to a kind of hard, dry bread which keeps long, and is hence the common bread used at sea. Biscuits are either fermented or unfermented. The kinds of biscuits in ordinary use are generally fermented, while the unfermented biscuit is that which is used in the navy, and hence called *sea-biscuit*. Its good quality chiefly depends on the thorough kneading of the dough, and the subsequent division of it into portions of equal size and thickness. When properly prepared it will continue perfectly sound for eighteen months to two years, and in regard to nutritive properties it has been ascertained that eighteen ounces of biscuit are exactly equal to twenty-four ounces of fresh-baked ordinary bread. Owing to the immense quantities of biscuit required for the navy, manual labour in the preparation of it has been supplanted by machinery. First the meal, consisting of a mixture of fine flour and middlings, is conveyed into a cylinder 4½ feet long and 3 feet 2 inches in diameter, and the exact quantity of water ascertained to be necessary, and regulated by a gauge, is let in from a cistern. A shaft armed with knives, and placed in the centre of the cylinder, is made to revolve horizontally through the meal and water, and in two minutes the mixture is converted into 5 cwt. of well-mixed dough. The dough, removed by a simple but ingenious process, is placed under two breaking rollers of 1500 lbs. each, which by passing over it backwards and forwards perform the process of kneading, and in the course of five minutes give to the dough a solid, perfect, and equal consistency. The dough is now cut into pieces 18 inches square, placed on boards 6 feet long by 3 feet wide, and conveyed to a second set of rollers, which pressing upon each square give it the requisite thickness by spreading it evenly over the whole surface of its board. In this state the board is placed under the stamping plate, which instantly cuts and stamps, or as it is called *docks*, the dough into forty-two hexagonal biscuits, which are forthwith conveyed on carriages to the oven. The hexagonal form being the only one which will cut the whole dough without leaving interstices is justly preferred to any other; and the stamping is not only to separate and perforate the biscuits, but to impress each with the broad arrow and the number of the oven in which it is to be baked. Each oven, made of wrought iron, has an area of about 160 square feet, and receives at one time 112 lbs. of raw biscuit, afterwards reduced by baking to about 100 lbs. The advantages gained by the machinery are both in the unlimited power of supply and the great saving of expense. Bakehouses have been erected at the victualling yards of Deptford, Gosport, and Plymouth. Previously, though double gangs of workmen were constantly employed, the demand in time of war could not be met by the government establishments, and required the employment of contractors often at an extravagant price. The manufacture of

biscuits other than those used in the navy has recently attained very great dimensions, and some establishments employ several thousand hands. More than a hundred different kinds are manufactured, and in the larger works manual labour has been quite superseded by machinery.

BISHOP (a word derived from the Greek *episcopos*, that is, overseer, through the Saxon *biscop*), in the early Christian church, was the name of every person to whom the care of a Christian congregation was intrusted. Every congregation even in country districts had at least one such overseer. The word was accordingly used in the early history of the church in exactly the same sense as presbyter or elder. This is confirmed not only by the express statements to that effect of the oldest ecclesiastical writers, but also by the New Testament itself. In Acts xx. 17 the writer of the Acts of the Apostles says that Paul sent from Miletus to Ephesus for the 'elders' of the church, and in the 28th verse he addresses these elders as 'overseers' or 'bishops;' and the apostles, in addressing the elders of the church, in some instances speak of themselves as presbyters or fellow-presbyters (1 Pet. v. 1; 2 and 3 John 1). The identity of the original signification of the words 'presbyter' and 'bishop' was acknowledged by the Christian fathers St. Jerome and St. Augustine in the fifth century, and even by Pope Urban II. at the end of the eleventh century, and it is not denied by many Episcopalians even at the present day. By the Council of Trent, however, the doctrine which placed presbyters and bishops originally on a footing of perfect equality in the early church was declared as a heresy, the object of which was to deny to the bishops of the church the priority of rank which they claimed. Those who adhere to the Episcopal form of church government, and at the same time admit the original identity of presbyters and bishops, differ from the Presbyterians in their theory of the origin of the episcopal authority. The Episcopalians maintain that even before the words had a separate meaning attached to them, the distinction between bishops and subordinate pastors existed in fact, and was a regular ecclesiastical institution, those who held a peculiar authority over others being appointed originally by the apostles. The Presbyterians, on the other hand, believe that the authority that was undoubtedly conceded to certain of the 'bishops' or 'presbyters' when they met to consider the affairs of the church, was not due to any formal appointment, but merely to the mutual agreement of the assembled presbyters, and that this distinction was no more than a mark of respect paid to some member who was venerable by his age or distinguished by his piety. But, whichever of these two theories may be correct, there is no doubt of the fact that at a comparatively early period in the history of the church a position of authority was acquired by the pastors of the Christian communities belonging to certain places, and that these came to be distinguished from the others by the name of bishops. The growth of this authority was favoured by the doctrine which was started about the beginning of the second century with regard to the priestly dignity being a peculiarly divine institution. The more this doctrine was affirmed the higher grew the claims of the bishops. Ignatius of Antioch, who died about 115, had already declared every bishop to be a representative of Christ, and 100 years later the doctrine of the apostolical succession was developed, that is to say, the doctrine of the transmission of the ministerial authority in uninterrupted succession from Christ to the apostles, and through these from one bishop to another. By the foundation of new churches in the larger towns which were affiliated to the original churches, and by the dependence of the presbyters

in the country districts upon those having urban charges, the authority of the bishops came to be gradually extended over greater or less dioceses; and at the same time the bishops began to reserve to themselves peculiar privileges. While at first the bishops in all the more important matters were dependent on the approval of the presbyters and congregations, they appear at the Council of Nice in 325 as the sole possessors of the right of voting.

While this then was the position of the bishops in relation to the presbyters, they at first considered themselves as standing on a footing of equality in relation to each other. But as certain of the presbyters in their assemblies had acquired a priority of rank over the others, it gradually came about in the same way that the bishops of the chief cities (Jerusalem, Antioch, Corinth, Alexandria, Constantinople, Rome) obtained a similar precedence among the bishops, and received the title of metropolitan bishops; and so early as the beginning of the fourth century we find the Bishop of Rome claiming to be the head of the church as the true successor of Peter, whom Christ himself had pronounced to be the rock on which he would build his church. Rome, however, was not allowed to assume this rank uncontested. Several of the other metropolitan bishops claimed the rank for themselves, and the conflict went on until Syria, Asia Minor, and Egypt were wrested from Christendom by the Mohammedans, when the only two cities that were left to dispute the priority of rank in the church were Rome and Constantinople. Meantime the Bishop of Rome had assumed the title *Papa* ('father,' 'pope'), in order to avoid even the appearance of equality with the other bishops, and in course of time his claim was recognized throughout Christendom, except in those parts which were under the more immediate supremacy of the Bishop of Constantinople; and the contest between these two great cities of the West and the East was only ended by the separation of the Greek and Roman Churches in 1053. See **POPE**.

The practice of solemnly investing bishops with their offices dates from the seventh century. Already in the fifth century the popes had begun to send to the newly-elected metropolitan bishops (now called archbishops) the pallium, a kind of official mantle worn by archbishops, as a token of their sanction of the choice. Two centuries later it became the custom to consecrate bishops by investing them with the ring and crozier, the former as a token of marriage with the church, the latter as a symbol of the pastoral office. Since this investiture was what gave validity to the election of the bishops, it became the source of long-continued contests between the popes and the temporal sovereigns in the middle ages. The influential position which the bishops occupied in the state caused the temporal rulers to be desirous of keeping the right of investiture in their own hands, while the popes with equal determination claimed the right for themselves. The contest was most bitter between the popes and the emperors of the Romans, as they were called. It began in the eleventh century, but was not settled till 1122, when it was agreed in the Concordat of Worms between Pope Calixtus II. and the Emperor Henry V. that the election of bishops should take place according to the laws of the church, under the direction of the emperor, and that the spiritual investiture (with ring and crozier) should remain in the hands of the pope, while the bishops were to be invested with the temporal rights of their office by the emperor. This is still the fundamental law of the Roman Catholic Church with regard to investiture. (See **INVESTITURE** and **CONCORDATS**.) The election to a bishopric is for the most part in the hands of the dean and chapter of the cathedral of the diocese;

but in some cases it is a right of the territorial sovereign. In any case papal confirmation is requisite before the appointment is complete. Roman Catholic bishops in England are appointed exclusively by the pope.

When the system of ecclesiastical rule was matured, the almost absolute authority which they exercised over the clergy of their dioceses; their interference in the secular concerns of governments, to which they soon rendered themselves necessary by their superior information and their elevated rank; the administration of the church revenues; and their extensive ecclesiastical as well as criminal jurisdiction, caused their duties as teachers and spiritual fathers to appear of less importance. Still it continued to be the bishop's duty to teach and preach in his own diocese, to watch over purity of doctrine, to see that the people were provided with the sacraments, to visit the churches in his diocese, &c. The most distinctive functions of their spiritual office remained as they still are, the ordination of the clergy, the consecration of other bishops, the confirmation of youth, the consecration of churches, &c. In the middle ages they attached to themselves subordinate or assistant bishops called *suffragans* or *coadjutors*, who often had entrusted to them the performance of those functions which more especially concerned the church. The episcopal office being such as we have described it, the nobility, and even the sons of princes and kings, strove to obtain a dignity which was as honourable as it was profitable, and was not deemed incompatible with festivities and luxurious enjoyments. The splendid establishments which they were able to maintain from the large revenues derived chiefly from rich donations to their churches by pious devotees, gave, to the bishops of Germany particularly, a high degree of dignity. They became princes of the empire, and their influence on public affairs was highly important.

The Reformation lessened the number of bishops, and although in some of the Protestant countries of the N. of Europe, the higher clergy have retained the title of *bishop*, yet they have lost the greater part of their former revenues and privileges, although in neither of these particulars have those of England any reason to complain. The English Church has left to its bishops more authority than the rest, and this is one reason why it bears the name of *episcopal*. To them belong ordination, confirmation, the consecration of churches, the licensing of curates, and institution to benefices. They receive their appointment from the crown. (See CLERGY, CHURCH OF ENGLAND, DIOCESE, ECCLESIASTICAL DIVISIONS, &c.) In Prussia, though the majority of the population are Protestants, the Roman Catholic bishops receive an annual allowance from the state. Some bishops in the Roman Catholic Church are nominally in charge of dioceses in countries which do not acknowledge the Christian faith. The dioceses of such bishops are said to lie *in partibus infidelium* (in parts belonging to unbelievers), and they are chiefly those that were wrested from the Christian church by the Mohammedans. (See IN PARTIBUS.)

The bishops of the Greek Catholic Church have less authority than those of the Roman Catholic Church. They are taken from the monastic orders, and they are appointed by the archbishops.

BISHOP, SIR HENRY ROWLEY, a distinguished musical composer, was born in London on Nov. 18th, 1786, and trained in his profession under Signor Bianchi, composer to the London Opera House. In 1806 he was appointed composer of the ballet music for the opera. In 1809 his first important opera, the *Circassian Bride*, was produced at Drury Lane with great success; but the following evening the theatre,

with the score of Bishop's opera, was consumed by fire. Numerous operas and other musical pieces now followed of his composition, and from this period to 1826 upwards of seventy works were produced by him. Among others may be mentioned the music of *Guy Mannering*, *The Slave*, *The Miller and his Men*, *Maid Marian*, *The Virgin of the Sun*, and adaptations of *The Barber of Seville* and the *Marriage of Figaro*. From 1810 to 1824 he acted as musical composer and director to Covent Garden Theatre. He also arranged several volumes of the *National Melodies*, and completed the arrangement of the music for Moore's *Irish Melodies*, commenced by Sir John Stevenson. In the year of Weber's visit to London with his *Oberon* (1826) Bishop produced an opera called *Aladdin*, which was not successful. He was elected Reid professor of music in Edinburgh University in 1841, was knighted in 1842, and in 1848 became professor of music in the University of Oxford. Sir Henry Bishop was never noted for prudence in pecuniary matters, and latterly was in rather distressed circumstances. He died 30th April, 1855. The music of Bishop, though not of the highest class, is yet eminently remarkable for its grace, liveliness, and spirit, and thoroughly English in its character. Many of his compositions, such as the music of *The Chough* and *The Crow*, and *When the Bloom is on the Rye*, have become familiar as household words.

BISHOP-AUCKLAND, a market town, England, in the county and 9 miles S.W. from the city of Durham, is situated on an eminence at the confluence of the Gaunless with the Wear, and has much improved in recent times. Near it is Auckland Palace, the episcopal residence, and among its buildings are a free grammar-school (founded 1605), St. Anne Chapel, Edgar Memorial Hall, Lightfoot Church Institute, and the Temperance Hall. It is almost wholly supported by the coal traffic. Pop. in 1891, 10,527; in 1901, 11,966. It gives name to one of the eight parliamentary divisions of the county.

BISHOP'S STAFF. See CROSIER.

BISHOP-STORTFORD, a market-town, England, county Hertford, 27 miles N.W. of London, is built in the form of a cross, and occupies the acclivities of two hills, on the river Stort. Among the public buildings are the handsome church of St. Michael, dating from the early fourteenth century, several other places of worship, grammar and other schools, and a diocesan training college for mistresses. The principal trades of the town are malting and brewing; bricks, coaches, &c., are also manufactured. Pop. in 1871, 6250; in 1891, 6595; in 1901, 7148.

BISHOP-WEARMOUTH. See SUNDERLAND.

BISIGNANO, a town of Italy, 14 miles N. from Cosenza, the seat of a bishop, and defended by a citadel. The cultivation of the silk-worm forms a principal branch of industry. Pop. 4200.

BISMUTH. This metal has been known from the fifteenth century, but its character was long ill-defined, and it was even supposed to be manufactured from zinc. It is found native in veins in gneiss, mica-slate, and other primitive rocks, and it also occurs combined with sulphur, oxygen, and arsenic, associated with ores of zinc, lead, silver, cobalt, and nickel. In England it has been got in Cornwall, Cumberland, and elsewhere; on the Continent in Norway, Sweden, France, Bohemia, and Transylvania; and it is also found in South Australia, New South Wales, Victoria, and Bolivia. The chief supplies of bismuth, however, come from Schneeberg in Saxony. The ore employed is native bismuth, and it is separated from the matrix by breaking it into suitable pieces, introducing these into iron tubes, laid at an angle over a furnace, and applying heat. The metal melts and runs into pots placed at the mouths of the tubes, the

gangue remaining behind. It is afterwards purified by fusion with a small quantity of nitre.

Native bismuth occurs in various forms, all more or less crystalline; its colour is white, with a pinkish tinge; it has metallic lustre, is soft and brittle, and can be easily reduced to powder in a mortar. Commercial bismuth has a crystalline structure, with sometimes an iridescent appearance. Bismuth crystallizes more readily than any of the metals, and very fine specimens may be obtained by melting a quantity in a deep pot, allowing it to cool, and then pouring off the central fluid portion through an opening in the superficial crust. Well-formed crystals are thus obtained, having sometimes a splendid iridescence. The specific gravity of bismuth is 9.83, its fusion point is 476°F. , and its crystals belong to the hexagonal system. It mixes readily with other metals, and forms very fusible alloys with them. Newton's fusible metal contains 8 parts bismuth, 5 lead, 3 tin, and fuses at 202°F. Dalton's contains 104 bismuth, 5 lead, 3 tin, and fuses at 187°F. Some of the alloys of bismuth have the property of expanding when they solidify. Solder, pewter, and other alloys largely used in the arts, contain bismuth.

Bismuth combines with various chemical elements. When dusted, in a fine state of division, into chlorine gas it catches fire and forms a white buttery substance, not unlike butter of antimony. This compound was known to Sir Robert Boyle, who prepared it by distilling metallic bismuth with corrosive sublimate. When metallic bismuth is heated to a high temperature in the air it burns feebly and forms a yellowish-white powder, which also occurs native, and is called by mineralogists bismuth-ochre. Another oxide is known which is possessed of slight acid functions. Finely divided bismuth when heated along with sulphur forms an opaque, crystalline, leaden, metallic-looking substance, which also occurs native, and is called *bismuth-glance*. The precipitated sulphide is a dark-brown flocky solid, got by adding sulphuretted hydrogen to a solution of bismuth.

Nitric acid dissolves bismuth readily, and so does aqua regia. If the solution be poured into a large excess of water a white powder is precipitated which is a basic salt. This precipitate is called *pearl-white*, *magistery of bismuth*, and other names, and is employed as a paint and as a cosmetic. It also serves, with certain precautions, as a test for bismuth. The subnitrate, carbonate, and citrate are the chief compounds employed in medicine.

By its chemical characters bismuth belongs to the phosphorus and arsenic group of elements. It is intermediate in properties between the non-metallic elements and the metals. It is a good example of the true metalloid, and this want of the full metallic character was partially observed long ago by Paracelsus, who classed it along with his semi-metals. One of its most striking characters is its diamagnetism.

BISON, the name applied to two species of ox. One of these, the European bison or aurochs (*Bos bison* or *Bison Europæus*), is now nearly extinct, being found only in the forests of Lithuania and the Caucasus (see Ox). The other, or American bison (*Bison Americanus*), is found only in North America, and is remarkable for the great hump or projection over its fore-shoulders, and for the length and thickness of its woolly hair. The hump is oblong, diminishing in height posteriorly, and gives a considerable obliquity to the outline of the back. The hair over the head, neck, and fore-part of the body is long and shaggy, forming a beard beneath the lower jaw, and descending below the knee (wrist) in a tuft. The hair on the summit of the head rises in a dense mass nearly to the tips of the horns, and, directly on the front, is curled and matted strongly.

Altogether the American bison, commonly called the buffalo, is of rather a formidable appearance, with his ponderous head, and its fell of thick shaggy hair and its streaming beard, supported upon a massive neck and shoulders, whose apparent strength is more imposing from the augmentation produced by the hump and the long hair covering the anterior parts of the body. There is a considerable difference between the summer and winter dress of the bison, consisting partly in the length, partly in the colour of the hair. In late summer, after the new coat is acquired, from the shoulders backwards, the surface is covered with a short fine dark hair, smooth and soft as velvet. Previous to this the old coat has fallen off, often leaving bare and unsightly patches. At this season the animal is fond of wallowing in mud to gain a protective covering of this material. Except the long hair on the fore-parts, which is, to a certain extent, of blackish colour, the colour is a uniform brown, becoming of a bleached and faded hue towards the end of winter. Varieties of colour are very rare among this species. The horns are usually 16 or 17 inches in length, and of a black colour. The bison bulls were more easily approached and killed by hunters than the cows, not being so vigilant, though the cows were preferred both on account of their finer skins and more tender flesh. The cow is much smaller than the bull, and has not so much of the long hair on the shoulders, &c.; her horns are not so large, nor so much covered by the hair. The sexual season begins towards the end of July, and lasts till near the beginning of September. The cows calve in April; the calves seldom leave the mother until a year old; cows are sometimes seen with calves of three seasons following them. Bison beef is rather coarser in the grain than that of the domestic ox, but is considered superior in tenderness and flavour. The hump is particularly celebrated for its richness and delicacy. The tongues and marrow-bones are regarded as next in excellence.

The American bison, or buffalo, was once extensively diffused over what is now the territory of the United States, except that part lying on the east of Hudson's River and Lake Champlain, and narrow strips of coast on the Atlantic and Pacific. Southward its range extended to the delta of the Mississippi and into part of Mexico, while in the northwest it reached even as far as the Great Slave Lake. The great prairies connected with the Mississippi system formed its favourite feeding-grounds, and here it used to be seen in herds whose numbers were well-nigh incredible. We are told, for instance, of a herd encountered in 1871, which extended over an area twenty-five miles in breadth by fifty miles in length, and was calculated to number not less than four million individuals. A traveller on the Kansas Pacific Railroad again declared that the train on which he was a passenger passed through a herd of buffalo for a distance of not less than one hundred and twenty miles. In those days, that is about or previous to 1870, the plains might often be seen black with moving masses of buffalo, which sometimes compelled the engine-drivers to bring their trains to a standstill. The animals used to congregate and perform regular migrations, which depended upon the season and the necessary supply of food, these movements being mainly from north to south and vice versa. All this is now a thing of the past, and the wholesale destruction of the bison is one of the most melancholy stories in the history of zoology. So long as it was pursued only or mainly by the Indians there was little to fear for it, though many tribes were almost wholly dependent on these animals for food, clothing, tents,

utensils, &c. Vast multitudes owing to this were slaughtered annually; but it is to be deeply regretted that the white hunters (especially after the spread of railways) were in the habit of destroying these interesting and valuable beasts in the most wanton and unnecessary manner. It was common for such persons to shoot bison, even when they had abundance of food, for the sake of the tongue or hump alone, or even because the animals came so near as to present a fair aim. It is therefore not to be wondered that, from all causes of diminution, the bison should become less and less numerous every year till it is now practically extinct, at least in the wild state. Latterly the National Museum of the United States thought it necessary to send out an expedition to collect a few specimens in view of this contingency; and a report furnished to the museum in 1886 shows what difficulty the expedition had in fulfilling its mission in consequence of the extermination of the bison having been already so nearly effected. In 1902, the matter having been brought before the senate, the secretary of agriculture reported that, in addition to some herds of domesticated and half-domesticated buffaloes, there were two quite small herds of wild buffaloes, one in the Yellowstone Park and the other in Lost Park, Colorado. Belief was expressed that unless government action was speedily taken the extinction of the pure-blooded buffalo would soon result.

The bison or buffalo may be domesticated without difficulty, and the animal breeds freely with the domestic or common ox, these half-breeds being fertile among themselves. There are some cross-bred herds of considerable size. The skins of bison, especially that of the cow, dressed in the Indian fashion, with the hair on, make admirable defences against the cold. They are called *buffalo robes*. A figure of the animal will be found in plate at UNGULATA.

BISSAGOS, a group of islands, about twenty in number, near the w. coast of Africa, opposite the mouth of the Rio Grande, between lat. 10° and 12° N., belonging, like the mainland opposite, to Portugal. The largest, Orango, is about 25 miles in length, and most of them are inhabited by a rude negro race. The inhabitants cultivate maize, bananas, and palms, but their chief employment is in fishing. Most of the islands are under native chiefs, who are nominally vassals of Portugal. At Bolama, or Bulama, once a British settlement, but abandoned in 1793, there is a thriving Portuguese town, which is the seat of government.

BISSET, ROBERT, a native of Scotland, educated at Edinburgh for the clerical profession. He got the degree of LL.D., and became a schoolmaster at Chelsea; but not succeeding in that occupation, he employed himself in writing for the press. His chief productions are—*A History of the Reign of George III.*, six vols. 8vo; *the Life of Edmund Burke*, two vols. 8vo; and an edition of *the Spectator*, with lives of the authors, six vols. He died in 1806, aged forty-six.

BISSEXTILE. See LEAP YEAR.

BITAUBÉ, PAUL JÉRÉMIE; born at Königsberg, in Prussia, 1732, of French parents. He translated Homer into French. In consequence of this translation, and the recommendation of D'Alembert, he was elected a member of the Academy at Berlin. Frederic II., king of Prussia, favoured him much, and allowed him to stay a long time in France, to finish several translations from the German into French. Among his translations is one of Goethe's Hermann and Dorothea. Napoleon conferred marks of favour on him. He died in 1808. His works appeared in nine vols., Paris, 1804.

BITHOOR, or BITTOOR, a town, India, 12 miles

n.w. of Cawnpore, on the right bank of the Ganges. In the Indian mutiny it had some notoriety conferred on it from being the residence of the miscreant Nana Sahib, also styled the Rajah of Bithoor. The town was long the abode of a line of Maharratta chiefs, the last of whom died without issue in 1861. His adopted son Nana Sahib, whose proper name, however, was Dhundoo Pant, claimed the succession, but his title was ignored by the East India Company, a proceeding which is believed to have stimulated him to his subsequent deeds of atrocity. General Havelock gained a brilliant victory over the rebels in the vicinity, and subsequently quantities of treasure belonging to the Nana were discovered by the troops in a well close to the palace. Pop. 8000.

BITHYNIA, an ancient country in Asia Minor, on the Black Sea, the Bosphorus, and the Sea of Marmora, and bounded on the s. by Phrygia. In early times it was called *Bebrycia*, from the Bebrycians who inhabited it. Before the time of Cressus, Bithynia was an independent state, under its own princes. After the death of Prusias I., in the war against Cressus, it fell into the power of the Lydians, B.C. 560; into that of the Persians, B.C. 555; and into that of Alexander, B.C. 334. The restorer of the Bithynian throne was Bias or Bas, a native prince, at the court of one of whose successors, Prusias II., Hannibal took refuge, and where he ended his life by poison, B.C. 183. Nicomedes, the last king of this race, bequeathed his kingdom to the Romans, B.C. 75. The famous cities of Nicomedia, Nicæa, and Heraclea were in Bithynia. In the eleventh century Bithynia was conquered by the Seljuks. In 1298 a new kingdom was founded there by the Ottoman Turks, of which, in 1327, Prusa was the capital.

BITLIS. See BERTLIS.

BITON, a Greek mathematician, of uncertain date, but supposed to have been a contemporary of Archimedes, wrote a work of some interest on warlike engines, and dedicated it to Atalua, king of Pergamos. It is to be found in the *Mathematici Veteres* of Thevenot.

BITONTO (ancient *Butuntum*), a town in the kingdom of Italy, in the province of Bari, in a fine plain, 15 miles w.s.w. from Bari. It is the seat of a bishop, and has a handsome cathedral, twelve parish churches, an hospital, a seminary, &c. The environs produce excellent wine, called *Zagarello*. At a short distance from the town the Spaniards gained a decisive victory over the Austrians, May 25, 1734. Pop. 22,726.

BITSCH, a town, formerly in France, now in German Lorraine, with some 3000 inhabitants, and a strong citadel on a hill, fortified by the art of Carmentaigne. It was ceded to Germany in 1871.

BITTERN, (*Botaurus*), the name applied to several birds of the heron family (*Ardeidae*). The bitterns have the bill strong, about as long as the head, compressed, and higher than it is broad; legs, as compared with other members of the family, rather short; neck comparatively short, covered on its sides and front with long loose feathers, which can be erected at pleasure. They are all birds of solitary habits, haunting wooded swamps and reedy or rushy pools and marshes, remaining concealed during the day and coming out at night to feed. The common bittern (*B. stellaris*) is especially remarkable for the booming or bellowing sound it makes, which has gained it popular and expressive names in different countries—such as *mire-drum* in England, and *Rohrdommel* in Germany. This cry is compared by Mudie to 'a burst of uncouth and savage laughter, piercingly or rather gratingly loud, and so unwonted and odd that it sounds as if the voices of a bull and a horse were combined, the former breaking down

his bellow to suit the neigh of the latter.' The bird rises in the air in a spiral while uttering this strange cry, strengthening its voice as the circles widen, and allowing it to sink as they contract. The bittern is about 28 inches in length, and about 44 in extent of wing, and is heavier in proportion to its wings than the heron. The general colour of the plumage is dull pale yellow, variegated with spots and bars of black; the feathers on the crown black, shot with green, those on the hinder part of the head and neck and on the breast long and loose; tail short; bill about 4 inches long; toes and claws long and slender, the middle claw being serrated on the inner edge. It feeds on small fishes, reptiles, snails, &c., and is an inoffensive and retiring bird, seldom seen unless when, as sometimes happens, it is frozen out during severe weather. The nest is placed in a loose tuft or bush near the water, and is constructed of rushes, reeds, grasses, and such-like materials. The eggs are four or five in number, and of a greenish-brown colour. The bittern was a favourite bird of sport when hawking was in vogue, and was protected by severe penalties. The little bittern (*B. minutus*) is the smallest bittern that occurs in Britain. It is a native of the s. of Europe, the s.w. of Asia, and probably of Africa generally. It is not more than 15 inches in length. The male has the head, back, and tail black, with green reflections; the neck, breast, and thighs buff; the rest of the under parts white. The female is brown above. It is a pretty rare visitant in Britain. The American bittern (*B. lentiginosus*) has also been found in Britain. It has some resemblance to the common bittern, but is much smaller and more minutely freckled. See plate at ORNITHOLOGY.

BITTERN is the name given to the syrupy residue from evaporated sea-water after the common salt has been taken out of it. The syrup contains salts of magnesium, which give it a bitter taste, and it is employed as a source of them. It is also one of the sources of bromine.

BITTERSWEET, or WOODY NIGHTSHADE. See NIGHTSHADE.

BITUMEN, the name of a species in mineralogy, the individuals composing which have acquired several distinct names from their diversity in appearance. This depends chiefly upon their state of aggregation, which forms an uninterrupted series from the perfectly fluid to the solid condition.

Naphtha, or native *naphtha*, as it is called to distinguish it from similar liquids obtained from coal tar, shale, caoutchouc, &c., is the most fluid variety, is nearly colourless, or of a yellowish tinge, transparent, and emits a peculiar odour. It swims on water, its specific gravity being from 0.71 to 0.84. It burns with a bluish-white flame and thick smoke, and leaves no residue. It consists of carbon 82.20, and hydrogen 14.80. From a very remote period it has been burned in lamps by the Persians instead of oil, and its use as a source of artificial light has become pretty general throughout Europe. With certain vegetable oils, *naphtha* is said to form a good varnish, and it is an excellent solvent for caoutchouc, gutta-percha, and resinous and fatty substances generally.

The variety *petroleum* is more abundant than *naphtha*, from which it appears to differ only by being thicker. In consistency it resembles common tar. It is of a strong disagreeable odour, and blackish or reddish brown in colour. It occurs, oozing out of rocks, in the vicinity of beds of coal, or floating upon the surface of springs. The strata from which this oil proceeds belong to the Devonian formation, and lie under the sandstone and limestone strata. The existence of this oil was known to the ancients, and Herodotus makes mention of oil-springs in the island of Zante; but it is only since about the year 1860 that

it has been applied to any great extent to practical purposes. Springs of petroleum are now known to exist in many different parts of the world—in Europe, Asia, Africa, and America. In Europe the principal places in which it is found are Alsace, Neufchatel in Switzerland, several parts of Italy, and very largely in Galicia. In Asia petroleum is found abundantly in Borneo, where the wells have been worked for centuries; it is found also in unlimited quantities on the south-west coast of the Caspian Sea, particularly in the neighbourhood of Baku, whence it is now largely exported into European markets. In America the principal supply is found in the so-called great basin extending from the Western Alleghenies to the Rocky Mountains, and from the valley of the Little Kanawha in Virginia to Lake Ontario, Pennsylvania and the valley of the Kanawha in Virginia being particularly productive. Canada also yields large quantities, and the oil is also obtained in Peru and Japan. It has risen to be a staple in the foreign trade of the United States and Russia. See PETROLEUM.

Elastic bitumen is soft, flexible, and elastic. It emits a strong bituminous odour, and its specific gravity is about the same as that of water. On exposure to the air it becomes hard, and loses its elasticity. It is sometimes called mineral caoutchouc, because it takes up the traces of crayons in the same manner as the caoutchouc or india-rubber. It is found in the lead-mines of Derbyshire, and St. Bernard's Well, Edinburgh, in France, and elsewhere.

Compact bitumen, or *asphaltum*, is of a shining black colour, solid, and brittle, with a conchoidal fracture; specific gravity 1 to 1.6. Like the former varieties, it burns freely, and leaves but little residue. It is found in Judea, in the Palatinate, in France, in Switzerland, and in large deposits in sandstone in Albania. In the island of Trinidad it forms a lake three miles in circumference, and of a thickness unknown. The bricks of which the walls of Babylon were built were cemented with hot bitumen. The well-known asphalt pavement is formed by mixing melted bitumen with gravel.

BIVALVE SHELLS, or BIVALVES. See MOL-LUSCA.

BIVOUACK (from the German *Beiwacht*), the name given to the modern system by which the soldiers in service lie in the open air without tents, in opposition to the old system of camps and cantonments. They remain dressed in order to be ready at a moment's warning to take their places in order of battle. Tents being laid aside, on the continent of Europe, for the sake of diminishing the baggage of an army, large masses of troops are always obliged to bivouack, even if they are not near the enemy. The soldier, however, is permitted to build himself a hut of straw or branches if circumstances allow it. Frequent bivouacking is very injurious to the health, and is also a great disadvantage to the countries in which it takes place.

BIZERTA, or BENZERTA (ancient *Hippo Zar-phus*), a seaport town and bay, regency of Tunis. The town stands on the w. side of the bay, 35 miles N. by W. of Tunis (to which there now runs a rail way), and is the most northern town of Africa. It is picturesquely situated, partly on both sides of a channel running inland to a lake, partly on an island in the middle of this channel which is less than a mile long. Since the French came into possession of Tunis they have carried out important works at Bizerta, with the object of establishing a strong naval port here. By the deepening of the entrance channel large vessels can now enter the lake, which forms a deep and perfectly land-locked harbour. A breakwater and a jetty have also been constructed

for the outer harbour in the bay. The country around is singularly beautiful and fertile, producing corn, pulse, oil, cotton, and fruits in great abundance. Pop. about 10,000.

BJÖRNSTJERNA, **MAGNUS FREDERICK FERDINAND**, COUNT, a Swedish statesman and author, born in 1779, at Dresden, where his father, afterwards plenipotentiary at the diet of Ratisbon, was then secretary to the Swedish legation, was educated in Germany, and in 1793 proceeded to Sweden to enter the army. During the Finnish war he displayed great gallantry, and rose to the rank of major. After the peace he was sent in 1809 on a secret embassy to Napoleon, with whom he had an interview the day after the battle of Eckmühl. In 1812, when in London, he managed the transaction for the sale of Guadaloupe, and in 1813, with the rank of colonel, accompanied the Swedish army to Germany. Here he was ordered to relieve Hamburg and defend the Four Territories (Vierlande), but was obliged to retire on the main body of the northern army. He was present at the battles of Grossbeeren and Dennewitz. When the army advanced to the Elbe he was the first to effect a passage and take possession of Wörlitz, though he was afterwards obliged to abandon it to the enemy. At the storming of Dessau two horses were shot under him, and he received a severe contusion from a cannon-ball. He was able, notwithstanding, to be present at the battle of Leipzig. He afterwards concluded the capitulation of Lübeck with General Lallemand, and received the surrender of the fortress of Maastricht. After the capitulation of Paris he fought first in Holstein, and then in Norway, till at last he concluded with Prince Christian Frederick at Moss the convention which was followed by the union of Norway and Sweden. In 1816 he became adjutant-general, and was made a baron. In 1820 he obtained the rank of lieutenant-general, in 1826 was made a count, and in 1828 was appointed plenipotentiary at the court of Great Britain. Here he continued till 1846, when he returned to Stockholm. He died in 1847. As an author he is chiefly known in politics as the advocate of a moderate liberalism and temperate reform of the representative system. On general subjects his most interesting works are *The British Rule in the East Indies*, and *The Theogony, Philosophy, and Cosmogony of the Hindoos*.

BLACK. See **DYEING** and **PIGMENTS**.

BLACK, JOHN, the well-known editor of the *Morning Chronicle*, was the son of a Berwickshire shepherd, and born in the Lammermoors in 1783. Left an orphan at the age of twelve, he was placed in the office of a writer in Dunee, and from thence proceeded to a similar employment in Edinburgh, where he continued for several years. During this period he devoted himself assiduously to the pursuit of knowledge, making considerable progress in classical studies, and also acquiring the German and Italian languages. In 1810 he removed to London, where he became engaged as parliamentary reporter for the *Morning Chronicle*, and ultimately rose to be its editor. His editorial management was noted for its fearlessness and independence. He died on 25th June, 1855, having previously retired from the editorship of the paper in 1843. Mr. Black was the author of a life of Tasso, and also translated the lectures of the brothers Schlegel on *Dramatic Art and Literature*, and on the *History of Literature, Ancient and Modern*.

BLACK, JOSEPH, a distinguished chemist, born at Bordeaux, of Scottish parents, in 1728, studied medicine at Glasgow. Dr. Cullen, his instructor, inspired him with a taste for chemical studies. In 1754 he was made Doctor of Medicine at Edinburgh, and de-

livered an inaugural dissertation, *De Humore Acido a Cibus Orto et Magnesia Alba*, in which he ascribes the difference between the mild and caustic alkalies to the presence of fixed air (carbonic acid) in the former. In 1756 he extended and republished his *Experiments on White Magnesia, Quicksilver, and several other Alkaline Substances*, in the second volume of the *Essays, Physical and Literary*, of the Edinburgh Society. The discovery of carbonic acid is of interest not only as having preceded that of the other gases made by Priestley, Cavendish, and others, but as having proceeded in its method the explanation given by Lavoisier of the part played by oxygen in combustion. About 1757 Black enunciated his doctrine of latent heat, which has led to such important results. In 1756 he was appointed professor of medicine and lecturer on chemistry in the University at Glasgow in the place of Dr. Cullen; and in 1766, when Cullen left the professor's chair in Edinburgh, he was there also succeeded by Black. No teacher inspired his disciples with such a zeal for study; his lectures, therefore, contributed much to make the taste for chemical science general in England. He died Dec. 6, 1799, at the age of seventy-one. Upon Lavoisier's proposal, the Academy of Sciences in Paris had appointed him one of its eight foreign members. His habits were simple and methodical, his character undemonstrative. With his characteristic caution and love of accuracy, Black did not adopt the Lavoisierian system until he was satisfied that it was more accurate than that of which he had been so long a teacher. In his later courses, however, he taught the anti-phlogistic system. Two or three papers by Black appeared in the *Transactions of the Royal Societies of London and Edinburgh*; two letters were published by Bull and Lavoisier; and his *Lectures on Chemistry*, in two vols. 4to, by Robison in 1803.

BLACKADDER, JOHN, a distinguished preacher among the Scottish Covenanters, was born in the year 1815. Having been duly licensed by the Presbyterian Church, then in its highest purity and most triumphant domination, he received a call in 1852 to the parish church of Troqueur, in the neighbourhood of Dumfries. In 1862 the episcopal form of church government was forced by the restored house of Stuart upon a people who were generally repugnant to it. Mr. Blackadder, so far from complying with the new system, employed himself for several successive Sundays in exposing what he considered its unlawfulness, and, in his own words, entered his 'dissent in heaven' against it. He and some of his brethren were conducted in honourable captivity to the capital, where he underwent some examinations, but was speedily released by the interest of his friends. He was now, however, obliged to demit his charge in favour of an Episcopal incumbent, and went with his wife and numerous family to reside at Caitloch, in the parish of Glencairn, a wilder and more central part of the stewardry of Kirkcudbright. In 1870, having performed worship at a conventicle near Dunfermline, where the people had armed themselves for self-defence, he was summoned before the privy-council, but contrived to elude their power, and when the search was a little slackened, he renewed his practice of itinerant preaching. On one occasion he preached at Kinkell, near St. Andrews; the people flocked from the metropolitan city to hear him, notwithstanding all the injunctions and surveillance of Archbishop Sharpe. It is said, that on Sharpe desiring the provost to send out the militia to disperse the congregation, he was informed that it was impossible—the militia had gone already as worshippers. In 1880 he made a voyage to Holland, and settled his son at Leyden, as a student of medicine. After spending several months in Holland,

be returned to Scotland, and in the succeeding year was apprehended, and confined in the state prison upon the Bass, where he died in December, 1685, having nearly completed his seventieth year. See *Crichton's Life of Blackadder*, 1823.

BLACK-BAND IRONSTONE. See **IRON**.

BLACK BEER. See **SPRUC-BREW**.

BLACK BEETLE, a name popularly but erroneously applied to the cockroach (which see), and also applied to a number of true beetles (Coleoptera) that are black in colour.

BLACKBERRY. See **BRAMBLE**.

BLACKBIRD (*Turdus merula*), called also the *merle*, one of the commonest and most esteemed of British song-birds. It belongs to the same family (Turdidae) as the thrush, missel thrush, fieldfare, &c., all of which are members of the tribe Dendroica, and the order Passeres or perching birds. It inhabits Europe, the N. of Africa, and the Azores, taking up its abode among plantations and copses near the dwellings of man. It is rather a shy bird, and does not care to show itself much, darting quickly with a sharp chatter of alarm from one cover to another, when startled by the appearance of an intruder. Its size is greater than that of the common thrush, but inferior to that of the missel thrush, its length being about 11 inches. The colour of the male bird ('theousel-cock so black of hue with orange tawny bill' of Bottom the weaver) is a uniform deep black, relieved only by the bright orange yellow of the bill and circle round the eyes. The female has the bill and circle round the eyes blackish brown, the throat yellowish brown, and the under parts rusty brown. The young birds resemble the females, and the males do not acquire the yellow bill till after the second moult. The nest is built early in spring, such situations being chosen for it as a thick hedgerow, a low close bush, an ivied tree or wall, and even the side of a dry ditch. The materials of which it is built are moss, fibrous roots, and small sticks, strengthened internally by a coating of mud, and lined inside with fine dry grass. The eggs are generally four or five in number, of a greenish-blue colour, spotted with various shades of brown, and very variable in hue and markings. The song of the blackbird is a fine, rich, mellow, and flute-like strain; but is neither so varied or so continuous as that of the thrush. It is heard for a considerable period of the year, as two or three broods of young blackbirds are annually produced, and the male bird sings during the breeding season. It has good powers of mimicry, and is not only able to imitate the notes of other birds, but can be taught to whistle tunes, and even to utter words. It feeds on insects, worms, snails, &c., and is particularly fond of strawberries, cherries, pears, and other fruits, thus often bringing destruction upon itself. It may be questioned, however, whether the mischief it does is not fully counterbalanced by the services it performs in destroying snails and other pests of the garden. In winter snails form a large part of this bird's food, and it is very dexterous at breaking the shells against a stone, in order to come at the animal. Albino, or white blackbirds with red eyes, are sometimes found. The blackbirds or crow-blackbirds of America are quite different from the European blackbird, and are more nearly allied to the starlings and crows. See **CROW-BLACKBIRD**; see also plate at **ORNITHOLOGY**.

BLACKBURN, a municipal, parliamentary, and county borough of England, in Lancashire, 21 miles N.W. from Manchester. It is pleasantly situated in a sheltered valley, and is somewhat irregularly built. The parish church of St. Mary's is spacious and elegant, and is surmounted by a lofty square tower. There are a number of other churches, both

established and of other denominations, that might be particularly mentioned as being handsome buildings. There is a free grammar-school, founded by Queen Elizabeth in 1557; a free school for girls, founded by William Leyland in 1785; a technical school, and a free library. The town-hall, infirmary, exchange, municipal offices, county court, county police station, opera house, library and museum, and union workhouse are all modern and handsome buildings. There are two public parks, one, called the Queen's, of 33 acres, and another, called the Corporation Park, of 50 acres, beautifully situated on the declivity of Revidge Hill. The railways afford great facilities for traffic. They all converge, and pass through one large railway-station belonging to the Lancashire and Yorkshire Railway Company. There are electric, steam, and horse tramways in the town, and steam tramways to Darwen and Church. Blackburn is one of the chief seats of the cotton manufacture, there being upwards of 140 mills, as well as works for making cotton machinery and steam-engines. The cottons made in the town and vicinity have an annual value of about £5,000,000. Blackburn sends two members to Parliament. Haygreaves, the inventor of the spinning jenny, was a resident of Blackburn. Pop. in 1871, mun. bor., 76,339; parl. bor., 82,928; in 1891, parl. and mun. bor., 120,064; in 1901, 127,527.

BLACK-CAP (*Sylvia atricapilla*, or *Curruca atricapilla*), a songster which rivals, and by some is even preferred to the nightingale. It is nearly 6 inches long, and has the upper part of the head black, the hind part of the neck ashy brown, the upper parts of the body dark gray, with a greenish tinge, the throat, breast, and belly more or less silvery white, the legs bluish, the claws black, the irides dark hazel, and the bill brown. The female is larger, and has a generally darker plumage than the male. The black-cap is met with in most parts of Europe, particularly the N. and E.; it is only found in England from the beginning of April to September. Its favourite haunts are gardens, orchards, and thick hedges, and its favourite food ivy berries, though for these it readily substitutes currants and other small garden fruits, and feeds also on grubs or caterpillars. Its nest, built generally among brambles and nettles, or in some low bush, is formed of a little moss, dried grass, and wool, lined with fibrous roots and some long hairs; its eggs, from five to six, are reddish-brown, mottled with a deeper colour, and sometimes dotted with a few ashy specks. In its natural state it is a mocking-bird, and in a cage soon learns the notes of the nightingale and canary. Bechstein, while admitting that it has less volume, strength, and expression than the nightingale, considers its tones more pure, easy, and flute-like, and its song perhaps more varied, smooth, and delicate.

BLACK CHALK. See **STATE**.

BLACK COCK. See **GROUSE**.

BLACK DEATH. See **PLAGUE**.

BLACKFISH (*Pautoga americana*), a fish of the wrasse family caught on the N. American coast, especially in the vicinity of Long Island, whence large supplies are obtained for the New York market. The name *blackfish* is bestowed on account of the colour of its back and sides, which are of a bluish or crow black; the lips, lower jaw, neck, and belly, especially in the males, are white. The mouth is rather small, the lips skinny or fleshy, and the teeth are about twelve in number in each jaw, the two front teeth being largest, and the rest of the respective rows gradually decreasing in size. The tongue is white, smooth, lying close to the jaw, but discoverable by raising; tall entire, and somewhat convex, the middle rays being somewhat more

prominent than the upper and lower ones; gill covers smooth, neither scaly, serrated, nor rough; extremities of the pectoral fins whitish; eyes rather small. The blackfish is plump in appearance, and is much esteemed for the table. It varies in size, from 2 or 3 lbs. to 10 or 12 lbs. Rocks, reefs, and rough bottoms of the sea, in the neighbourhood of the coast, are the situations most frequented by the blackfish, which appear to be stationary inhabitants of the salt water, as they do not, like the salmon, herring, &c., desert their haunts to visit the fresh-water rivers. These fish are caught in abundance along the whole of Long Island Sound, Fisher's Island Sound, and in Narragansett Bay. They are also found in the southern bays of Long Island, and on the ocean banks of Sandy Hook. In catching blackfish, the hand-line is generally used, though the rod may often be advantageously employed: they seize the bait greedily, at proper seasons, and pull strongly, in proportion to their size and weight. They are occasionally taken in seines. Another fish, the *Centrolophus morio*, is also called blackfish. It is a native of the Mediterranean, but is also sometimes found on the British coast. It belongs to the mackerel family (Scomberidae), and varies in size, some specimens being 15 inches long, and others more than double that size. It is of a black colour, the fins intensely so; the under parts are rather paler.

BLACK FOREST (in German, *Schwarzwald*), a chain of mountains in the grand-duchy of Baden and the kingdom of Wurtemberg. It runs almost parallel with the Rhine, from s. to n., often only from 15 to 20 miles distant from this river; is about 85 miles long, and from s. to w. in the southern part about 30 miles wide; in the northern about 18. The Danube rises in these mountains, as well as many other rivers. Those on the w. side run into the Rhine; those on the e. side into the Danube. The Black Forest is rather a chain of elevated plains than of isolated peaks. The highest summit, the Felsberg, measures 4900 English feet. Except from June to September, these mountains are generally covered with snow, and even during this period are not entirely free from it. Among the many valleys of this chain, the Murgthal is particularly celebrated for its beautiful scenery. The whole chain consists of primitive mountains: its skeleton throughout is granite; its higher points are covered with sandstone, and other layers of less consequence. On the western side, at the foot, appears gneiss. Porphyry and clay-slate are found on several heights, as likewise silver, lead, copper, iron, cobalt, and other minerals. The forests are extensive, and consist mostly of pines and similar species. The raising of cattle is the principal branch of husbandry carried on in this district. The ground is not fertile, and the inhabitants scattered over the mountains live extremely frugally, and are very industrious. The vast quantity of timber growing here has long been a considerable source of revenue. The timber of the Black Forest was always highly prized by the Dutch, and the export to Holland is still largely carried on, the trees being conveyed down the Rhine in the form of rafts. Many saw-mills are kept at work cutting up the timber; and the forests also give employment to charcoal-burners, potash-boilers, &c. The manufacture of the well-known wooden clocks, toys, &c., is another important branch of industry, in which many persons are employed. Watches are also made, as well as orchestrions and other musical instruments. Neustadt, Friburg, Hornberg, and Furtwangen are central points of the manufacture of wooden wares, the commerce in which embraces all Europe, and extends to America and Australia.

BLACKHEATH, a village and well-known heath, England, county of Kent, the former about 6 miles s.e. of London, with which it is connected by railway, pleasantly situated on a gentle slope on the verge of the heath. It consists of one principal street, spacious, but irregular; the houses plain, and mostly of brick. Close by is Morien College, a quadrangular red-brick building, founded by Sir John Morden in 1695 for the benefit of decayed Turkey merchants. The heath contains about 70 acres within its present limited bounds. It is very picturesque, and in summer is much resorted to by pleasure parties, donkey-riding being one of the amusements for which it is well adapted. It commands beautiful views of London and the banks of the Thames, and is bordered by numerous rows of elegant villas. This celebrated heath has been the scene of many remarkable events, such as the insurrections of Wat Tyler and Jack Cade, and was formerly a notorious resort of highwaymen.

BLACKIE, JOHN STUART, poet, litterateur, and professor, was born at Glasgow in 1809, and educated at the universities of Aberdeen and Edinburgh. Subsequently he went to Gottingen, Berlin, and Rome, where he continued his studies, which were chiefly connected with philology. In 1834 he published a translation of Goethe's *Faust*, and the same year became an advocate at the Scottish Bar; but this profession grew to be so irksome that, in 1841, he readily accepted the Chair of Humanity in Marischal College, Aberdeen. This position he held until, in 1852, he was appointed to the professorship of Greek in the university of Edinburgh, a chair which he resigned in 1882. His generous enthusiasm and versatility as a writer and lecturer were frequently placed at the service of some unfriended cause, such as university reform in the Scottish Universities, the conservation of Scottish customs, the re-introduction of a Scottish parliament, and the preservation of the Gaelic language. By his unwearied efforts in the latter cause he succeeded in raising £12,000 throughout the country, with which sum a Celtic Chair has been endowed in Edinburgh University. In his earlier years the professor's eccentric manner and impatient advocacy of the causes he undertook to champion made him many enemies, but latterly his innate kindness and generosity became generally apparent, so that when he died on 2nd March, 1895, he was one of the most honoured and popular of Scotsmen. Among his more important writings are:—*Lyric Poems* (1860); *Homer and the Iliad* (1866); *Musa Burschicosa* (1869); *Home Hellenica* (1874); *Self-culture* (1874); *Songs of Religion and Life* (1876); *Lays of the Highlands and Islands* (1872); *Lay Sermons* (1881); *Altaviva* (1882); *Wisdom of Goethe* (1883); *Life of Burns* (1888); *Scottish Song* (1888); and *Song of Heroes* (1889). His biography has been published (2 vols.) by Anna M. Stoddart.

BLACKING. The article employed in blacking boots and shoes, usually contains for its principal ingredients oil, vinegar, ivory or bone black, sugar or molasses, and strong sulphuric acid, though every manufacturer has his own recipe, and endeavours to turn it to best account by concealing its composition and puffing its merits. In this way several large fortunes are understood to have been made. Blacking is used either liquid or in the form of a paste, but both are obtained from the same ingredients, the only difference being that in making the paste a portion of the vinegar is withheld. One celebrated blacking, which bears the name of patent, consists of 18 oz. of caoutchouc dissolved in 9 lbs. of hot rape-oil, 60 lbs. ivory-black, 45 lbs. molasses, and 20 gallons vinegar of strength No. 24, in which 1 lb. finely-

ground gum-arabic has been dissolved. The whole mixture, after being carefully triturated in a paint-mill, receives 12 lbs. sulphuric acid, in small successive quantities, stirring strongly for half an hour. The stirring is continued for half an hour daily during a fortnight, and then 3 lbs. of gum-arabic are added, after which the stirring is resumed, and continued as before for another fortnight. This gives fine liquid blacking; the paste is obtained within a week by only withholding 8 of the 20 gallons in which the gum-arabic is dissolved.

BLACK ISLE, the peninsula in the county of Ross and Cromarty, Scotland, between the Moray Firth, Beaulie Loch and Firth, and Cromarty Firth.

BLACK-LEAD. See **PLUMBAGO**.

BLACK LETTER, that variety of type otherwise designated Gothic, and which in a modified form is the ordinary type made use of in Germany. The earliest printed books were in black letter. See **PRINTING**.

BLACKLOCK, THOMAS, a poet remarkable for his literary attainments under the misfortune of blindness, was born at Annan in 1721. At the age of six months he lost his sight by small-pox; and as he grew up his father endeavoured to lessen his calamity by reading to him such books as instructed or entertained him. At the age of twenty he lost his father, on which he was invited by Dr. Stephenson, a physician in Edinburgh, to visit that metropolis, in order to pursue his studies at the university. In 1754 he brought out an edition of his poems, which was favourably received; and another edition being soon afterwards published by subscription, a considerable sum was thereby raised for his benefit. He now devoted himself to the study of theology, and, having passed through the usual course, was licensed, in 1759, by the presbytery of Dumfries. He was soon after appointed minister of Kirkcudbright, on the presentation of the Earl of Selkirk; but being opposed by his parishioners, after two years' contention he resigned his living, upon a moderate annuity, and retired to Edinburgh, where he received students of the university as boarders. In 1786 he was created D.D.; and having now taken a respectable station among the literati of Scotland, he maintained it by various publications until his death, July, 1791. A favourable criticism by Dr. Blacklock of the first edition of Burns's poems led the poet to give up his idea of emigrating to the West Indies, and caused him instead to go to Edinburgh, where he at once became famous.

BLACKMORE, SIR RICHARD, physician and poet, was the son of an attorney in the county of Wilts, and was born probably about 1650. In 1668 he entered the University of Oxford, and in 1674 took the degree of B.A. Having travelled abroad he took the degree of M.D. at Padua, and was admitted fellow of the Royal College of Physicians in 1687. In 1697 he had risen to so much eminence as a physician as to be appointed physician to King William, who knighted him. In the preceding year he had made himself known as a poet by the publication of his heroic poem of *Prince Arthur*, which was soon followed by *King Arthur*. In 1700 he published a poem entitled *Satire on Wit*, in which he assailed his literary contemporaries on the score of irreligion and grossness. This naturally raised him up a number of enemies, while his ponderous epics, produced in quick succession, ensured the rally of all those to whom his gravity, perseverance, and mediocrity afforded subject for ridicule. The worthy man thus became the common butt of his day, being attacked by Dryden, Pope, and Swift, not to mention others. The work which produced him the greatest reputation was *The Creation*, a poem in

seven books, which went through several editions and was greatly applauded, but is, generally speaking, very tamely elaborate. He also wrote treatises on medicine besides various other prose works. He died in 1729.

BLACKPOOL, a town in England, on the coast of Lancashire, between the estuaries of the Ribble and Wyre, 27 miles s.s.w. of Lancaster, which has of late years attracted many visitors by its advantages as a watering-place. It affords excellent accommodation for visitors in the numerous hotels, hydropathic establishments, and lodging-houses, and consists of ranges of lofty houses about 3 miles long facing the sea, in front of which an excellent promenade and carriage drive extends along the whole distance. The town is abundantly supplied with the means of amusement and recreation, including theatres, concert rooms, fine winter gardens, aquarium, extensive pleasure-grounds, park of 60 acres, a great steel tower ('Eiffel Tower') over 600 feet high and accommodating about 10,000 persons, a gigantic wheel, &c. There are also a court-house and three markets, several churches, and chapels of various denominations, libraries and news-rooms (including a free library), &c. Blackpool was incorporated as a municipal borough in 1876. It now gives name to a parl. div. of Lancashire. The number of persons that visit it annually is enormous. Pop. (1881), 14,448; (1891), 28,846; (1901), 47,346.

BLACK PRINCE. See **EDWARD**.

BLACK ROD, USHER OF THE, an officer of the House of Lords, appointed by letters patent from the crown, and employed to execute orders for the commitment of parties guilty of breach of privilege and contempt, to assist at the introduction of peers and other ceremonies; and to summon the Commons to attend in the House of Lords when the royal assent is given to bills. His proper title is gentleman-usher of the black rod; that of his deputy, yeoman-usher.

BLACK SEA, among the ancients known by the name of *Pontus Eurinus* (which see), a sea which is situated between Europe and Asia, and is bounded on the w. by Turkey, Bulgaria, and Roumania, n. w. n. and e. by the Russian dominions, and on the s. by Anatolia (Asia Minor), being connected with the Mediterranean by the Bosphorus, and with the Sea of Azoph by the Strait of Yenikale. The area of the Black Sea and the Sea of Azoph amounts to about 180,000 square miles. The water is not so clear as that of the Mediterranean, and, on account of the many large rivers which fall into it—the Danube, Dniester, Dnieper, Don, Kuban, &c.—being less salt, freezes more readily. The tempests on this sea are sometimes tremendous in winter, as the land which confines its agitated waters gives to them a kind of whirling motion; but being practically clear of islands and rocks its navigation is not difficult on the whole. In 1854 one of its tremendous storms occasioned a very serious loss to the shipping of the allied British and French. The fisheries in the Sea of Azoph and the Black Sea are not unimportant, various kinds of valuable fish both large and small being taken; among others, several species of sturgeon. Caviare is made on the coast, as well as fish-glue, fish-oil, and, from the spawn of the sea mullet, botargo. The chief ports are Odessa, Kherson, Nicolaiev, Sebastopol, Novorossiisk, Batoum, Trebizond, Samsun, Sinope, and Varna. After the capture of Constantinople (1453) the Turks excluded all but their own ships from the Black Sea till 1774, when the Russians obtained the right to trade in it, the same right being accorded to Austria in 1784, and to Britain and France in 1802. The preponderance thereafter gained by Russia was one

of the causes of the Crimean war, by which she was compelled to cease keeping armed vessels on it, the sea being declared neutral by the Treaty of Paris in 1856. In 1871, however, the sea was denaturalized by a conference of the European powers (France being unrepresented) at London in response to a protest from Russia.

BLACKSTONE, SIR WILLIAM, Knight and LL.D., a celebrated English lawyer, and the most popular writer on the laws and constitution of his country, was born in London in 1723, and was the third son of Mr. Charles Blackstone, a silk mercer. He was educated on the foundation of the Charter House, whence in 1738 he was removed to Pembroke College, Oxford. He was much distinguished, both at school and at the university, and at an early age compiled a work for his own use, entitled the *Elements of Architecture*, which has been much praised. Having chosen the profession of the law, he was in due time entered at the Middle Temple, and on this occasion published the admired verses called the *Lawyer's Farewell* to his Muse, which appeared in *Dodley's Miscellany*. In 1743 he was elected fellow of All-Souls College, Oxford, and in 1746 was called to the bar, and commenced the practice of law. Being deficient in elocution, and not possessed of the popular talents of an advocate, his progress was slow. Having attended the courts of law at Westminster for seven years, without success, he determined to quit the practice of his profession, and retire to his fellowship at Oxford. The system of education in the English universities supplying no provision for teaching the laws and constitution of the country, Blackstone undertook to remedy this defect by a course of lectures on that important subject; and the manner in which he executed the task has conferred a lasting distinction on Oxford. His first course was delivered in 1753, and was repeated for a series of years with increasing effect and reputation. These lectures doubtless suggested to Mr. Viner the idea of founding, by his will, a liberal establishment in the University of Oxford for the study of the common law; and Blackstone was, with great propriety, chosen the first Vinerian professor. His engagements at Oxford did not prevent his occasional practice as a provincial barrister; and in 1754, being engaged as counsel in a contested election for the county of Oxford, he was led into considerations on the elective franchise, which produced his work entitled *Considerations on Copyholds*. In this treatise he denied the right of copyholders to vote as freeholders; which led to a declaratory act of Parliament in establishment of that narrow doctrine. In 1759 he published a new edition of the Great Charter and Charter of the Forest, with an historical preface; and during the same year, the reputation which he had obtained by his lectures induced him to resume his attendance at Westminster Hall, when business and the honours of his profession soon crowded in upon him. In 1761 he was elected M.P. for Hindon, made king's counsel and solicitor-general to the queen. About this time he also married, and thereby losing his fellowship, was appointed principal of New Inn Hall; which office, with the Vinerian professorship, he resigned the next year. In 1765 he also published the first volume of his *Commentaries on the Laws of England*; a work of greater merit than any which had yet appeared on the subject. In this celebrated production the author does not confine himself to the humble duty of an expositor, but aspires to the higher character of a philosophical writer on jurisprudence; and having been preceded by no authors in the same line, his manner of accomplishing his task is entitled to great praise. It must not, however, be regarded as a philosophical investigation into the grounds and

merits of the English laws and constitution, so much as an elegant exposition and defence of an existing system. Whatever he found instituted, it was his purpose to support and eulogize; and consequently we are rather made acquainted with the 'legal reasons' of what is established, than instructed in the general principles of national legislation. This mode of treating the subject may be, in some degree, useful, by conveying a due notion of the grounds on which government and usage have proceeded, but of course will do little to advance the mind of a nation, and often a great deal to nurture prejudices and impede amelioration. Notwithstanding some passages against standing armies, and in exposition of the progress of the influence of the crown, Blackstone is uniformly the advocate of prerogative, and very confined in his notions of toleration. The real merit and talents of Blackstone, backed by political tendencies which are generally favourable to advancement, now made him an object of ministerial favour, and he was offered the post of solicitor-general in 1770, and, declining it, was made one of the justices of Common Pleas, which station he held until his death in Feb. 1780, in his fifty-seventh year.

BLACKWELL, ALEXANDER and ELIZABETH, husband and wife. The former was son of a principal of Marischal College, Aberdeen, and was born about the beginning of the eighteenth century. He eloped with his wife to London, where he was first employed as a corrector of the press to Mr. Wilkins, an eminent printer. Afterwards he was enabled to set up as a printer on his own account, and for this purpose he occupied a large house in the Strand. But he did not long pursue this business before an action was brought against him for not having served a regular apprenticeship to it. The unsuccessful defence of this action ruined him, and one of his creditors threw him into jail. In this emergency the good genius of his wife came to his relief. She happened to possess a taste for drawing flowers; and the acknowledged want of a good herbal at that time (1735) occurred to her as affording the means of exerting this gift in a useful way. She accordingly hired a house near the botanic garden at Chelsea, where she had an opportunity of receiving the necessary flowers and plants in a fresh state, as she wanted them; and not only made drawings of the flowers, but also engraved them on copper, and coloured the prints with her own hands. Her husband lent all the aid in his power by attaching the Latin names of the plants, together with a short account of their principal characters and uses, chiefly taken by permission from Miller's *Botanicum Officinale*. The first volume of the work appeared in 1737, in large folio, containing 252 plates, each of which is occupied by one distinct flower or plant. The second volume, completing the number of plates to 500, appeared in 1739. It was afterwards republished on the Continent. After his release from prison Blackwell wrote a work on agriculture, which led to his being engaged to go to Stockholm, under the patronage of the King of Sweden. Having cured the king of an illness, he was appointed one of the royal physicians, and was apparently on the high road to fortune, when he was accused of being concerned in a plot against the constitution of the kingdom, and being condemned, was executed in 1747. The date of Mrs. Blackwell's death is not known.

BLACKWELL, THOMAS, a learned writer of the eighteenth century, was brother of Alexander, noticed above, and born at Aberdeen, August 4, 1701. After receiving the rudiments of his education at the grammar-school of his native city, he entered his academical course at the Marischal College, where he took the degree of A.M. in 1718. A separate pro-

fessorship of Greek had not existed in this seminary previous to 1700. Blackwell, having turned his attention to Greek, was honoured in 1723, when only twenty-two years of age, with a crown appointment to this chair. He entered upon the discharge of the duties of his office with the utmost ardour. It perfectly suited his inclination and habits. He was an enthusiastic admirer of the language and literature of Greece, and the whole bent of his studies was exclusively devoted to the cultivation of polite learning. Dr. Blackwell first appeared before the public as an author in 1737. His *Inquiry into the Life and Writings of Homer* was published at London during the course of that year, but without his name. A second edition of the work appeared in 1746, and shortly after *Proofs of the Inquiry into Homer's Life and Writings*. These proofs chiefly consisted of a translation of the Greek, Latin, Spanish, Italian, and French notes subjoined to the original work. The *Inquiry* contains a great deal of research, as well as a display of miscellaneous learning. In 1748 he published anonymously *Letters concerning Mythology*. In the course of the same year he was advanced to be principal of his college. In 1750 he opened a class for the instruction of the students in ancient history, geography, and chronology. Prelections on these branches of education he thought necessary to render more perfect the course at Marischal College. He, therefore, himself undertook the task. The design of his opening this class evidently was to pave the way for the introduction of a new plan of teaching into Marischal College, which, accordingly, he soon after accomplished. In 1762 he obtained the degree of LL.D., and in the subsequent year published, in quarto, the first volume of *Memoirs of the Court of Augustus*. A second volume appeared in 1755, and a third, which was posthumous, and left unfinished by the author, was prepared for the press by John Mills, Esq., and published in 1764. Dr. Blackwell died at Edinburgh in 1757.

BLACKWOOD, ADAM, a learned writer of the sixteenth century, was born at Dunfermline in 1539. Scotland, during his youth, was undergoing the agonies of the Reformation. He therefore found it no proper sphere for his education; and went to Paris, where, by the liberality of his youthful sovereign, Queen Mary, then residing at the court of France, he was enabled to complete his studies, and to go through a course of civil law at the University of Toulouse. Having now acquired some reputation for learning and talent, he was patronized by James Beaton, the expatriated Archbishop of Glasgow, who recommended him very warmly to Queen Mary and her husband the dauphin, by whose influence he was chosen a member of the Parliament of Poitiers, and afterward appointed to be professor of civil law at that court.

Poitiers was henceforth the constant residence of Blackwood, and the scene of all his literary exertions. His first work was one entitled *De Vinculo Religionis et Imperij, Libri Duo* (Paris, 1575), to which a third book was added in 1612. His next work was entitled *Apologia pro Reipublica*, and professed to be an answer to George Buchanan's work, *De Jure Regni apud Scotos*. He next published, in French, an account of the death of his benefactress, Queen Mary, under the title, *Martyre de Maria Stuart Reine d'Ecosse* (Antwerp, 8vo, 1588). At the end of the volume is a collection of poems in Latin, French, and Italian, upon Mary and Elizabeth; in which the former princess is praised for every excellence, while her murderess is characterized by every epithet expressive of indignation and hate. In 1598 he published a manual of devotions

under the title, *Sanctarum Precationum Proemia*, which he dedicated to his venerable patron the Archbishop of Glasgow. In 1609 appeared at Poitiers a complete collection of his Latin poems. He died in 1613, in the seventy-fourth year of his age, and was splendidly interred in St. Porcharius' Church at Poitiers, where a marble monument was reared to his memory, charged with a long panegyric epitaph. In 1644 appeared his *Opera Omnia*, in one volume 4to, edited by the learned Naudæus, who prefixes an elaborate eulogium upon the author. His brother Henry distinguished himself as a physician at Paris, and died in 1613.

BLACKWOOD, WILLIAM, an Edinburgh bookseller, well known as the projector and publisher of Blackwood's Magazine, was born at Edinburgh, Nov. 20, 1776. He settled in his native city as a bookseller in 1804, and soon added the trade of a publisher to his original business. The first number of Blackwood's Magazine appeared on the 1st of April, 1817, and from the first was conducted in the Tory interest. It was started just at the time when the general peace which had been established in Europe was beginning to reanimate the hopes of the Whigs, and when it was all the more necessary for the Tories to defend by the press that preponderance which they still held in Parliament. Mr. Blackwood was fortunate enough to secure as his coadjutors in his new literary undertaking most of the leading authors of the day belonging to the Tory party, among them Sir Walter Scott, John Gibson Lockhart, Hogg (the Ettrick Shepherd), Professor Wilson (Christopher North), De Quincey (the English Opium-eater), and others. All that was connected with the management of the magazine he took into his own hands, and he himself selected the articles for each number—a task for which he was admirably qualified, for although he wrote little himself, he was an admirable judge of literary works. The new magazine on its first appearance entered upon a campaign against the Edinburgh Review, combating both its political views and its literary decisions. From the first it attracted a great deal of attention, and its success was decided by the appearance of the *Notæ Ambrosianæ*, a series of articles in the form of dialogues, in which the current questions in politics and literature were discussed with the most pungent sarcasm and inexhaustible humour. The brilliant articles of Dr. Maginn added not a little to its reputation, and constantly, as the original contributors withdrew, new and valuable accessions were made to the staff of its supporters. Mr. Blackwood died Sept. 16, 1854, but his business continued to be carried on by his sons, and the magazine, although it has perhaps lost some of its former reputation (or notoriety), still keeps its place as one of our leading periodicals. Among contributors other than those above referred to may be mentioned Bulwer-Lytton, Professor Aytoun, Sir Archibald Alison, Charles Lever, George Henry Lewes, George Eliot, Sir Theodore Martin, Mrs. Oliphant, and W. W. Story.

BLACKWOOD'S MAGAZINE. See BLACKWOOD (WILLIAM).

BLADDER, URINARY, a musculo-membranous bag or pouch destined to receive and retain for a time the urine which is secreted by the kidneys. It occupies the anterior and median portion of the pelvis, and in the male of the human subject is situated behind the pubis and above and in front of the rectum; in the female above and in front of the vagina and uterus. It is composed properly of three coats—an outer or cellular, a middle or muscular, and an inner or mucous—while the peritoneum also forms a coating over part of its external surface. The urine secreted by the kidneys is conveyed into

this reservoir by means of two tubes called the ureters, which open near the neck or lower part of the bladder in an oblique direction, by which means they prevent the reflux of the urine. When empty it forms a rounded, slightly conoid mass about the size of a small hen's egg. As it gradually fills with urine its walls become distended in all directions, except in front, and it then rises above the pelvis proper into the abdomen. It is held in its place by two lateral ligaments, one on each side, and an anterior ligament. The contents are carried off by the urethra, which, as well as the neck of the bladder, is surrounded by a substance called the prostate gland. The bladder is subject to many ailments and diseases. These include inflammation of its coats, calculous concretions, disease of the urethra, causing obstruction to the passage of its contents; and it is also subject to cancer, fungus, paralysis, &c. A urinary bladder is found in all the mammalia, and in some fishes, but not in birds or reptiles.

BLADDER-NUT, a name of shrubs or small trees of the genus *Staphylea*, order Sapindaceæ (or according to some authorities Celastraceæ), natives of Europe, Asia, and North America, the fruits of which consist of an inflated bladderly capsule containing the seeds. The common European bladder-nut is *S. pinnata*, that of N. America is *S. trifoliata*. Both are not uncommon in shrubberies, and yield a hard white wood used by turners and others.

BLADDER-WORM, the name for an asexual stage of tape-worms, in which the animal has somewhat the appearance of a bladder with a so-called head attached. Some of these forms are known as *Cysticercus*. See PARASITES.

BLADDERWORT, the common name of slender aquatic plants, genus *Utricularia*, order Lentibulariaceæ, species of which are natives of Britain, the United States, &c., growing in ditches and pools. They are named from having little bladders or vesicles, that fill with air at the time of flowering and raise the plant in the water, so that the blossoms expand above the surface. They belong to the carnivorous or insectivorous class of plants.

BLADDERWRACK (*Fucus vesiculosus*), a seaweed so named from the floating vesicles in its fronds.

BLADENSBURG, a village of the United States, in Maryland, 6 miles N.E. Washington. A battle was fought here August 24, 1814, between the British and Americans, in which the latter were defeated. This success of the British led the way to the conquest and burning of Washington.

BLADUD, in legendary British history, the father of King Lear. He is said to have been the founder of the city of Bath, having been cured of his leprosy by its medicinal waters.

BLAEU, **BLAEUW**, or **BLAUW**, a Dutch family celebrated as publishers of maps. William (1671-1638) established the business at Amsterdam, constructed celestial and terrestrial globes, and published *Novus Atlas* (6 vols.), an excellent work, and *Theatrum Urbium et Munimentorum*. His son John (died 1673) published the *Atlas Major* (11 vols.), and various topographical plates and views of towns. The works of this family are still highly valued. One of the volumes of the *Atlas Major* contains forty-nine maps of the different parts of Scotland, prepared by Timothy Pont, a Scottish geographer and surveyor. These are of very great value.

BLAGOVESHITCHENSK, a Russian town of Eastern Siberia, capital of the province of the Amoor, and of the general government of the Amoor, on the river Amoor, where it receives the Zeya, near the Chinese town of Aigoon. Founded as a military post in 1856 it is now an important place, with

secondary schools, theological seminary, &c. Pop. (1896), 25,261.

BLAINE, **JAMES GILLESPIE**, American statesman, born at West Brownsville, Penn., in 1830. He entered Washington College at the age of thirteen, graduated in 1847, studied law, acted as a teacher, and then having gone to Augusta, Maine, was for several years newspaper editor. He was sent to Congress by Maine as a republican in 1862, and was repeatedly re-elected. Soon becoming prominent he was several times speaker of the House of Representatives. In 1876 he entered the Senate, and the same year he was second in his candidature for presidential nomination by the republican national convention; he was also unsuccessful in his candidature in 1880; but in 1884 he was nominated by a large majority, though the presidency went to Mr. Cleveland. In 1888 though again a candidate for nomination he was defeated. His chief work is his *Twenty Years of Congress* (1883-86), 2 vols., a work which has had a very favourable reception. He was an advocate for protection as against free-trade. He died in 1893.

BLAINVILLE, **HENRI MARIE DUCROTAY DE**, a French naturalist, born at Arques, near Dieppe, in 1778. He studied medicine and the allied sciences at Paris, and obtained his degree of M.D. in 1808. He was for a time assistant to Cuvier, whose influence helped to place him in the chair of anatomy and zoology in the Faculty of Sciences at Paris in 1812. Unfortunately misunderstandings soon arose between the master and his comparatively youthful rival, and ultimately terminated in an open rupture. In 1825 Blainville was admitted to the Academy of Sciences as the successor of Lacépède, and on the death of Lamarck in 1829, the chair which he held in the Museum of Natural History having been divided, the department of mollusca, zoophytes, and worms was committed to Blainville, whose important works on these groups made it impossible to confer it on any other. In 1832 he quitted this department to become the not unworthy successor of Cuvier in the chair of comparative anatomy in the same establishment. His works, contained both in the more important collections of the period, and in separate treatises, are too numerous to be enumerated, but mention is especially due to *L'Organisation des Animaux ou Principes d'Anatomie Comparée* (1822); *Manuel de Malacologie et de Conchyliologie avec Atlas de 100 planches* (1825); *Cours de Physiologie Générale* (1829-32); *Manuel d'Actinologie* (1834); *Sur les Principes de la Zooclassie* (1847); and above all, the gigantic but unhappily unfinished work entitled *Océographie ou Description Iconographique Comparée du Squelette et du Système Dentaire des Cinq Classes d'Animaux Vertébrés, Récents et Fossiles* (1838-60). He died May 1, 1850.

BLAIR, **HUGH**, D.D., Scottish divine and writer, was born at Edinburgh, April 7, 1718, and commenced his academic career at the university there in 1730. In 1741 he was licensed as a preacher, and the following year was ordained to the parish of Collessie in Fife, but a few months after he was elected to the second charge of the Canongate, Edinburgh. In 1754 he received one of the city charges, that of Lady Yester's church, and in 1758 one of the charges of the High Church. In 1759 he commenced a course of lectures to students upon the principles of literary composition; and in 1762 he was made professor of rhetoric and belles-lettres in the University of Edinburgh, being the first that ever occupied this chair. He continued to lecture till 1783, when he published his lectures. These were merely a compilation from different sources, only designed to form a simple and intelligible code for

the instruction of youth in this department of knowledge. Regarded in this light they are entitled to very high praise, which has accordingly been liberally bestowed by the public. In 1768 he published a dissertation on the Poems of Ossian, in the authenticity of which he firmly believed.

It was not till 1777 that he could be prevailed upon to offer to the world any of those sermons with which he had so long delighted a private congregation. One of the sermons having been sent by Mr. Strahan, the king's printer, to Dr. Johnson for his opinion, Mr. Strahan received from him the following characteristic note: 'I have read over Dr. Blair's first sermon with more than approbation; to say it is good is to say too little.' Mr. Strahan thereupon agreed to purchase the volume, with Mr. Cadell, for £100. The sale was so rapid and extensive, and the approbation of the public so high, that, to their honour be it recorded, the proprietors made Dr. Blair a present, first of one sum, and afterwards of another, of £50, thus voluntarily doubling the stipulated price. The volume speedily fell under the attention of George III., and by a royal mandate to the exchequer in Scotland, dated July 25, 1780, a pension of £200 a year was bestowed on Dr. Blair. During the subsequent part of his life Dr. Blair published three other volumes of sermons; and it might safely be said that each successive publication only tended to deepen the impression produced by the first. He died on the 27th December, 1800.

BLAIR, JAMES, a divine, who was reared for the Episcopal Church of Scotland, at the time when it was struggling with popular dislike in the reign of Charles II. Discouraged by the equivocal situation of that establishment in Scotland, he voluntarily abandoned his preferences and removed to England, where he was patronized by Compton, bishop of London. By this prelate he was prevailed upon to go as a missionary to Virginia about 1685, and having given the greatest satisfaction by his zeal in the propagation of religion, he was, in 1689, preferred to the office of commissary to the bishop, which was the highest ecclesiastical dignity in that province. His exertions were by no means confined to his ordinary duties. Observing the disadvantage under which the province laboured through the want of seminaries for the education of a native clergy, he set about, and finally was able to accomplish, the honourable work of founding the College of Williamsburgh, which was afterwards, by his personal intervention, endowed by King William III. with a patent under the title of the William and Mary College. He died in 1743, after having been president of this institution for about fifty, and a minister of the gospel for above sixty years. He had also enjoyed the office of president of the Council of Virginia. In the year before his death he had published at London his great work, entitled, *Our Saviour's Divine Sermon on the Mount Explained, and the Practice of it Recommended, in Divers Sermons and Discourses* (four vols. 8vo).

BLAIR, JOHN, an eminent chronologist and geographer, a native of Scotland, which country he quitted for London about the middle of the 18th century. In 1754 the publication of a work in folio, entitled *The Chronology and History of the World from the Creation to A.D. 1753*, gained him great reputation. He dedicated his work to the Lord-chancellor Hardwicke, and in 1767 was appointed chaplain to the Princess-dowager of Wales, and mathematical tutor to the Duke of York, whom he accompanied, in 1768, on a tour to the Continent, having already received several ecclesiastical preferments. On his return to England he published, in 1768, a new edition of his *Chronological Tables*, with fourteen maps of ancient and modern geography

annexed. He died June 24, 1762, of an attack of influenza.

BLAIR, ROBERT, author of *The Grave*, a poem, was the eldest son of the Rev. David Blair, one of the ministers of Edinburgh, and chaplain to the king. He was born in the year 1699, and after the usual preparatory studies, was ordained in 1731 minister of Athelstaneford, in East Lothian, where he spent the remainder of his life. Blair was at once a man of learning and of elegant taste and manners. He was a botanist and florist, and was also conversant in optical and microscopical knowledge, on which subjects he carried on a correspondence with some learned men in England. He was a man of sincere piety, and very assiduous in discharging the duties of his clerical functions. While still very young Blair wrote some verses to the memory of his future father-in-law, Mr. Law, who was also his blood-relation. His *Grave* was chiefly composed in that period of his life which preceded his ordination as a parochial clergyman. It was first printed in 1743, and is now esteemed as one of the standard classics of English poetical literature, in which rank it will probably remain longer than many works of greater contemporary or even present fame. Blair died in 1746. His fourth son, Robert, rose to be president of the Court of Session.

BLAIR-ATHOLE, a village of Scotland, in the county of Perth, on a plain near the confluence of the Tilt and Garry, on the great Highland road from Perth to Inverness, and on the Highland Railway, 30 miles N.N.W. from Perth. It forms one village with Bridge-of-Tilt on the opposite or left side of that stream, and is situated in the midst of wild mountain scenery. At a short distance is Blair Castle, the seat of the Duke of Athole. As partly rebuilt in 1869-72, it is a handsome mansion in the Scottish baronial style. The oldest portion of it is said to date back to the year 1209, and many historic memories are associated with it. Pop. of village in 1881, including Bridge-of-Tilt, 346; in 1891, 326.

BLAIRGOWRIE, a town in Perthshire, Scotland, finely situated on the river Erlich, on the N. side of Strathmore. It is a prosperous place, its chief industries being the spinning and weaving of flax and jute. It has a growing trade in such small fruits as raspberries, strawberries, &c., which are grown in its neighbourhood. Besides the parish church there are several churches of other denominations. The purity of the air and the beauty of the scenery round Blairgowrie have rendered it a favourite summer resort. In the parish, which is 11 miles long and in some parts 8 broad, the Erlich makes some fine natural cascades; and there are several lakes and a chalybeate spring, formerly much resorted to. Several cairns and Druidical circles are found here. Pop. in 1891, 3714; in 1901, 3377.

BLAKE, ROBERT, a celebrated British admiral, was the eldest son of a merchant in the Spanish trade, settled at Bridgewater, where Blake was born in 1598. After attending the grammar-school of his native place he was sent to Wadham College, Oxford, where he took the degree of B.A. in 1617. On his return to Bridgewater he lived for some time in a private manner on the fortune left him by his father, and was led, by the gravity of his own disposition and by his family connections, to embrace the principles of the Puritans, by whose interest he was elected member for Bridgewater in the Parliament of 1640. This being soon dissolved he lost his election for the next, and immediately sought to advance the cause in a military capacity in the war which then broke out between the king and Parliament. He soon distinguished himself by his activity. In 1649,

in the manner of those times, when military men often served on shipboard, he was sent to command the fleet in conjunction with Colonels Deane and Popham, and thus commenced the naval career which has given him so distinguished a place in British history. He immediately sailed to Kinsale in quest of Prince Rupert, whom he attempted to block up in that port. The prince, contriving to get his fleet out, escaped to Lisbon, where Blake followed him; and being refused permission to attack him in the Tagus by the King of Portugal, he took several rich prizes from the Portuguese (against whom the Parliament declared war), and followed Rupert to Malaga, where, without asking permission of Spain, he attacked him, and nearly destroyed the whole of his fleet. On his return to England he was made *warden of the Cinque Ports*, and soon after reduced the islands of Scilly and Guernsey. In 1652, on the prospect of a Dutch war, he was made *sole admiral*, and on the 19th of May was attacked in the Downs by Van Tromp with a fleet of forty-five sail, the force of Blake amounting only to twenty-three. He, however, fought so bravely that Van Tromp was obliged to retreat. He then continued his cruise, took a number of Dutch merchantmen, and after several partial actions, drove the enemy into their harbour and returned to the Downs. May 29 he was again attacked by Van Tromp, whose fleet was now increased to eighty sail. Blake, who could not bear the thought of a retreat, engaged this vast force with a very inferior number and an unfavourable wind; but, after every possible exertion, was obliged to retreat into the Thames, on which Van Tromp was so much elated that he sailed through the Channel with a broom at his mast-head, to signify that he had swept the sea of British ships. In the February following Blake, having with great diligence repaired his fleet, put to sea with sixty sail, and soon after met the Dutch admiral, who had seventy sail and 300 merchantmen under convoy. During three days a furious running fight up the Channel was maintained with obstinate valour on both sides, the result of which was the loss of eleven men-of-war and thirty merchant ships by the Dutch, while that of the English was only one man-of-war. It was in April of this year that Cromwell assumed the sovereignty, on which occasion Blake and his brother admirals issued a declaration that, notwithstanding this change, they resolved to persist in faithfully performing their duty to the nation. 'It is not for us,' said Blake to his officers, 'to mind state affairs, but to keep the foreigners from fooling us.' June 3 he again engaged Van Tromp with dubious success; but renewing the action the next day, he forced the Dutch to retire with a considerable loss in ships and men into their own harbours. On his return he was received by Cromwell with great respect, and returned member in the new Parliament for Bridgewater. Aware of his affection for a republican government, the Protector was not displeased at having occasion to send him, with a strong fleet, to enforce a due respect to the British flag in the Mediterranean. He sailed first to Algiers, which submitted, and then demolished the castles of Goletta and Porto Ferno, at Tunis, because the dey refused to deliver up the British captives. A squadron of his ships also blocked up Cadiz, and intercepted a Spanish Plate fleet. Being now very sick, he resolved to do one more service to his country before his death, and sailed with twenty-four ships to Santa Cruz, in Teneriffe; and notwithstanding the strength of the place, burned the ships of another Spanish Plate fleet which had taken shelter there, and by a fortunate change of wind came out without loss. His brother having failed in some part of duty during this service,

he immediately removed him from his command. Finding his disorder making rapid progress he then sailed for England, and amidst his frequent inquiries for the sight of the English coast, expired while the fleet was entering Plymouth Sound, August 17, 1667. His body was honoured with a magnificent public funeral, and interred in Westminster Abbey, whence it was, with pitiful spite, removed at the Restoration and buried in St. Margaret's Churchyard. The foregoing detail sufficiently evinces the bravery and talents of this able commander, who first deviated from the old practice of keeping ships and men as much out of danger as possible, and gave the example of bold and spirited achievement. So disinterested was he that, after all his rich captures and high posts, he scarcely left behind him £500 of acquired property, freely sharing all with his friends and seamen, into whom he infused that intrepidity and spirit of enterprise by which the British navy has been ever since so highly distinguished.

BLAKE, WILLIAM, poet, painter, and engraver, the son of a hosier, was born in London on Nov. 28, 1757. At the age of ten he was sent to a drawing-school, and four years later he was apprenticed for seven years to the engraver James Basire, for whom he drew from the monuments in the older London churches and in Westminster Abbey. In 1778 he studied in the Royal Academy, and about this time he began to engrave for the booksellers, among his chief productions being plates after Stothard for the *Novelists' Magazine*. To the first exhibition of the Royal Academy he sent a drawing entitled *The Death of Earl Godwin*. He married in 1782, and for the three years 1784-87 carried on a printseller's shop in partnership with another engraver. From his earliest years Blake was a mystic. He believed that all things exist in the human imagination alone, and had a wonderful power of imaginative vision which enabled him to see angels in trees and in fields, great men of past times, &c. His *Songs of Innocence*, verse and designs, published in 1789, and the companion *Songs of Experience*, 1794, were reproduced by himself and his wife by a process which he believed to have been revealed to him in a dream by a dead brother. In 1793-1800 he produced a large number of designs, among them 537 illustrations for Young's *Night Thoughts*. In 1800 he became acquainted, through Flaxman, with the poet William Hayley, who gave him artistic commissions, and for three years he lived in his neighbourhood at Felpham. He next produced the designs to Blair's *Grave* (engraved by Schiavonetti), which stand in the forefront of his artistic work. In 1808 he sent to the Royal Academy the pictures *Christ in the Sepulchre* guarded by Angels, and *Jacob's Dream*, the last pictures he exhibited there. From 1813 till his death he had a staunch friend and patron in the painter John Linnell. It was about this time that he executed the series of pencil drawings known as *Spiritual Portraits*. The highly prized woodcuts to Thornton's *Virgil* were executed in 1820, and shortly afterwards he produced for Linnell his wonderful inventions to the *Book of Job*, besides a series of engravings and designs from the *Divina Commedia*. He died on Aug. 12, 1827. Among Blake's other writings are: *Poetical Sketches* (1783); *Gates of Paradise* (1793); *Prophetic Books*, sadly incoherent, but with splendid designs (1793-1804). The only complete edition of his works is that of E. J. Ellis and W. B. Yates (3 vols., 1893). See *Gilchrist's Life* (1863), and *Works* by Swinburne (1868), and *Story* (1899).

BLANC, MONT. See MONT BLANC.

BLANCHARD, FRANÇOIS, French aeronaut, born in 1753, displayed great ingenuity by the invention of a

hydraulic machine, in the nineteenth year of his age, and afterwards in the construction of a flying ship, which, by means of a counterpoise of 6 pounds, was raised to more than 20 feet from the ground. He eagerly availed himself of the discoveries of the brothers Montgolfier, and the improvements of the same by Professor Charles and M. Robert in Paris. After having made his first aerostatic voyage, March 4, 1784, he crossed the Channel from Dover to Calais, 1785, with Dr. Jeffries, a gentleman of Boston, in the United States. For this exploit he was rewarded by the King of France with a present of 12,000 francs and a pension of 1200. In the same year, at London, he first made use of a parachute invented by him, or, according to others, by Etienne Montgolfier. After having performed many aerostatic voyages in foreign countries also, he was accused of propagating revolutionary principles, and imprisoned, 1793, in the fortress of Kufstein, in the Tyrol. Having obtained his liberty, he made his forty-sixth ascent in the city of New York, 1796. In 1798 he ascended with sixteen persons in a large balloon at Rouen, and descended at a place 15 miles distant. In 1807 his aerostatic voyages amounted to more than sixty-six. He died in 1809.—Madame Blanchard continued to make aerial voyages. In 1811 she ascended in Rome, and after going a distance of 80 miles, she rose again to proceed to Naples. In June, 1819, having ascended from Tivoli, in Paris, her balloon took fire at a considerable height, owing to some fire-works which she carried with her. The gondola fell down in the Rue de Provence, and the hapless aeronaut was dashed to pieces.

BLANCHARD, JACQUES, a painter, born in Paris in 1800, received the first lessons of his art from Bellori, his maternal uncle, studied some time at Lyons, and in 1824 repaired to Rome. After two years he visited Venice, studied the works of Titian and the other great colourists of his school, and executed several paintings which gave him a name. After his return to Paris he executed a great number of works, which procured him the surname of the French Titian. His best piece, a Descent of the Holy Spirit, is in the cathedral of Notre Dame. He was cut off by consumption in 1838, when only in his thirty-ninth year.

BLANCHARD, LAMAN, a writer of some eminence, born at Great Yarmouth in 1808, commenced life as reader in a printing-office in London, became secretary to the Zoological Society in 1827, and in 1828 made his first appearance as an author by the publication of a volume of poetry, entitled *Lyrical Offerings*. In 1831 he became editor of the *Monthly Magazine*, and was afterwards connected with several magazines and newspapers. He was remarkable for the kindness of his nature and the readiness of his pen, which, though often employed on subjects which gave scope for wit and sarcasm, was never dipped in gall. The death of his wife affected him so deeply that he became subject to great depression of spirits, and in a moment of temporary insanity he unhappily terminated his own life, in 1845.

BLANCHE, the name of several female personages who make a distinguished figure in history.—1. BLANCHE OF CASTILE, daughter of Alphonso IX., queen of Louis VIII., king of France, and mother of St. Louis. On the death of Louis VIII. she anticipated the formal appointment of a regency by procuring the immediate coronation of her son, and during his minority held the reins of government in his name with distinguished ability and success. In 1244, when St. Louis took his departure for the Holy Land, she again became regent, and gave new proofs of her talents and virtues. Her days are said

to have been shortened by the long absence of her son, and a prevailing rumour that he had resolved to remain permanently in Palestine. She died at Melun in 1252 or 1253.—2. BLANCHE, daughter of Peter, duke of Bourbon, in 1353, when fifteen years of age, married Peter, king of Castile, surnamed the Cruel. Don Frederick, Peter's natural brother, had been deputed to meet her at Narbonne, and bring her into Spain, and she is said to have so far forgotten herself as to conceive a violent passion for him. Rumours to this effect had reached the king's ears, and though he celebrated the marriage, he soon showed that he had placed his affections elsewhere. He shortly after declared the marriage null, imprisoned the queen in the castle of Medina Sidonia, and is said to have soon after got rid of her by poison.

BLANCO, CAPE (literally, *white cape*), a name given to a great number of capes by the Spaniards, Portuguese, and Italians. It corresponds to the French *cap blanc*. The name is as common and as unphilosophical as that of White Hill, Black River, &c.

BLANDFORD FORUM, a municipal borough and parish, England, county Dorset. The town is 14 miles N.E. from Dorchester, beautifully situated on a bend of the river Stour, across which are three bridges. It has regularly laid out, well paved and lighted streets; well-built red brick houses; a town-hall and exchange, neat and commodious buildings; the church, situated in the centre of the town, an elegant modern structure in the Grecian style, with a tower and spire; also a grammar-school, and other schools; almshouses and other charities. Blandford is a borough by prescription; and a charter of incorporation was granted by James I. It gives the title of Marquis to the Duke of Marlborough. Pop. of borough (1891), 3874; (1901), 3649.

BLANK VERSE, verse without rhyme. This was the invariable form of the poetry of the ancients, but it is now peculiar to the Italian, English, and German languages. The poetry of the Anglo-Saxons and the earliest English poetry was not rhymed, yet it is not generally called blank verse, as their versification had a peculiarity of its own called alliteration (which see). When rhyme, however, was once introduced into English verse, it was for a long time regarded as the exclusive form of versification, and the Earl of Surrey, who was beheaded by order of Henry VIII. in 1547, is said to have been the first to use blank verse in England, namely, in his translation of the second and fourth books of Virgil's *Æneid*. The most common form of blank verse in English poetry is the decasyllabic, such as that of Milton's *Paradise Lost* and the dramas of Shakespeare. From Shakespeare's time it has been the kind of verse almost universally used by dramatic writers. Dryden, indeed, after the Restoration, introduced rhyme into his tragedies, in imitation of the French rhymed plays; but after keeping the stage for a number of years they became intolerable to the English ear, and the introduction of rhyme into the drama has never since been attempted in England. Shakespeare not uncommonly ends a scene with a few lines of rhyme, although the rest of the scene is in blank verse, and in the subordinate play interwoven with the action of Hamlet blank verse is used throughout. The first use of the term blank verse is said to be in Hamlet, ii 2: 'The lady shall say her mind freely, or the blank verse shall halt for't.'

BLANTYRE, a populous parish in Lanarkshire forming part of one of the richest coal-producing districts of Scotland. It is 6 miles in length and 1½ in breadth, and contains several villages, including High Blantyre, Stonefield, Blantyre Works village,

and Auchintibber. The chief employment of the inhabitants is coal-mining. On the top of a rock, opposite the noble ruins of Bothwell Castle, are the ruins of the ancient priory of Blantyre. In the village of Blantyre Works is the house in which Dr. Livingstone the missionary traveller was born. Over the beautiful Calder Glen has been thrown an immense railway viaduct consisting of iron girders, resting on stone piers, the highest nearly 100 feet. Population (1891), 11,352, including Stonefield town, 5581, and Blantyre town, 2255.

BLARNEY, a village of Ireland, 4 miles N.W. of the city of Cork, near the stream of same name, here crossed by a handsome bridge of three arches. It is a small but well-built place; and besides the parish church, contains a national school. Flax and cotton were formerly manufactured to some extent, but both of these branches have now decayed. Spinning and dyeing woollen yarn is, however, still carried on; and there is an extensive tweed manufactory employing a number of people. Blarney Castle stands on an isolated limestone rock at the junction of the Blarney and Comane. Erected in the fifteenth century, it was the scene of several interesting historical events; but derives its chief notoriety from a stone in its N.E. angle, several feet from the top, bearing a Latin inscription, recording the date of the erection, and called the 'Blarney Stone'. To this stone tradition ascribes the faculty of communicating to all who kiss it that species of most persuasive fluency of speech commonly called *blarney*. The 'groves of Blarney' are extensive and interesting, and beneath the castle there are also some curious natural caves.

BLASIUS, ST., or ST. BLAISE, Bishop of Sebaste, in Armenia, is said to have suffered martyrdom about 316, by order of Agricola, governor of Cappadocia and Little Armenia. He holds a place both in the Latin and Greek calendars, his day being the 3rd February. He is the patron saint of wool-combers, his flesh having been torn by iron combs. He is especially invoked in diseases of children and animals, and ailments connected with the throat are more particularly in his province.

BLASPHEMY is somewhat variously defined. According to the most general definition, it means the denying of the existence of God; assigning to him false attributes, or denying his true attributes; speaking irreverently of the mysteries of religion; and formerly, in Roman Catholic countries, it also included the speaking contemptuously or disrespectfully of the Holy Virgin or the saints. Public blasphemy has been considered by the Church of Rome as an unpardonable sin, and it was formerly punished with death by the municipal laws. The seventy-seventh novel of Justinian assigned this punishment to it; and the capitularies inflicted the same punishment upon such as, knowing of an act of blasphemy, did not denounce the offender. The former laws of France punished this crime with fine, corporal punishment, the gallows, and death, according to the degree and aggravation of the offence. The records of the parliaments supply numerous instances of condemnation for this crime, and many of punishment by death; others of branding and mutilation. A man was for this offence condemned to be hanged, and to have his tongue afterwards cut out, and the sentence was executed at Orleans as late as 1748. But it is remarked by a writer in the French *Encyclopédie Moderne*, that we should form an erroneous opinion from the present state of society of the effect of this offence, and the disorders it might introduce in former times; for religion was once so intimately blended with the government and laws, that to treat the received articles of faith or religious ceremonies with disrespect was in effect to attack civil institutions.

By the common law of England, as stated by Blackstone, blasphemy consists in denying the being and providence of God, contumelious reproaches of Jesus Christ, profane scoffing at Holy Scripture, &c., and is punishable by fine and imprisonment, or corporal punishment; the offence is also statutory, the statute 9 and 10 William III. cap. xxxii., declaring that if any one shall deny any of the persons of the Trinity to be God, or assert that there are more gods than one, or deny the truth of Christianity or of the Scriptures, he shall be incapable of holding any office; and for a second offence be disabled from suing any action, or being an executor, and suffer three years' imprisonment. By the statute of 63 George III. cap. clx., the words in italics were omitted. This was owing to the fact that the law was an infringement of the liberty of conscience, since some of the doctrines of certain sects of Christians, openly and habitually inculcated in their public assemblies, were violations of it. Blasphemy still remains punishable, however, both by common law and statute, the act last mentioned declaring it an offence to maintain that there are more gods than one, or to deny the truth of the Christian religion, or that the Scriptures are of divine authority. But prosecutions are very rare. In 1841 Mr. Moxon, the publisher, was found guilty of publishing a blasphemous libel in having published Shelley's *Queen Mab*, the action being brought to test the law on the subject. In 1867 it was pronounced to be blasphemous to publicly assert that the character of Christ was defective and his teaching misleading, and that the Bible was not inspired. In 1883, however, Lord Coleridge declared that 'if the decencies of controversy are observed, even the fundamentals of religion may be attacked without a person being guilty of blasphemous libel'; but this dictum has been questioned.

By the law of Scotland, as it stood under acts of 1661 and 1695, the punishment of blasphemy was death. Blasphemy consisted of railing at or cursing God, or of obstinately persisting in denying the existence of the Supreme Being, or any of the persons of the Trinity. The last individual who suffered the extreme penalty of this law in Scotland was a young man, aged twenty, the son of a surgeon in Edinburgh. His name was Thomas Aikenhead, and his trial and execution took place so late as the end of the seventeenth century. The acts of 1661 and 1695 were repealed by 53 George III. cap. clx. Persons found guilty of blasphemy at common law may be punished arbitrarily by fine and imprisonment. By 6 George IV. cap. xlvii., the publication of statements denying the existence or attributes of God or the authority of the Holy Scriptures is declared an offence punishable with fine and imprisonment. The act was put in force against Edinburgh booksellers in 1843.

The early legislation of the American colonies followed that of the mother country, and in some of them the crime of blasphemy was punished with death; but the penalty was mitigated before the establishment of the independence of the States, and imprisonment, whipping, setting on the pillory, having the tongue bored with a red hot iron, &c., were substituted. Several penalties against blasphemy are to be found in the laws of some of the New England states, according to which it is provided that, if any persons shall blaspheme, by denying, cursing, or contumeliously reproaching God, his creation, government, or final judging of the world, or by cursing or reproaching Jesus Christ or the Holy Ghost, or contumeliously reproaching the Word of God, consisting of the commonly received books of the Old and New Testament, he is liable to imprisonment for a term not exceeding five years. But the most direct and public violations of these laws are passed over without punishment or

prosecution. In many, and we believe the greater number of the states, the offence of blasphemy, not being a subject of special statutory provision, is only punishable either as an offence at common law, or a violation of the statute laws against profane swearing.

BLAST-FURNACE. See **IRON.**

BLASTING, the technical term for splitting and breaking up any object by means of gunpowder or some of the other powerful explosives now in use. The operation, which is of extensive use in quarrying, mining, and other branches of engineering, is often performed by boring a hole in the substance to be exploded, by means of an iron rod, called a *jammer*, filling it with gunpowder, and igniting this by means of a match, burning so slowly as to allow the parties employed to remove to a sufficient distance before the explosion takes place. At one time it was supposed that the force of the explosion depended on the firm packing of the gunpowder in the hole by means of small chips of stone, sand, &c. It has since been ascertained that loose sand is as effectual as firm packing, which in consequence has been generally laid aside. One of the most important modern improvements in blasting, is the firing of the charge by electricity. This mode is more especially applicable to submarine blasting, and was first practised for that purpose by General Pasley, in 1839. The only thing necessary is to make an interruption in the conducting wire at the point where the explosion is to take place. In passing the electric current, a spark produced at the interruption fires the charge. The effect being instantaneous the operator can fire any number of chargers simultaneously. Gun-cotton is often employed in blasting, and nitro-glycerine has also been found to be a very powerful agent in such operations, but its use requires the utmost caution, as it is very liable to explode unexpectedly with most disastrous results. The same objection does not apply to dynamite, which is quite as effective and perfectly harmless when properly handled.

BLAZONING, or BLAZONRY. See **HERALDRY.**

BLEACHING is the art of whitening linen, wool, cotton, silk, wax, also the materials of which paper is made, and other things. It is shown by experience that organic bodies, after being deprived of life, and becoming solid and dry, lose their colour and become white, by the influence of the air and the sunlight. Upon this fact the manner of bleaching which was formerly in use is grounded:—namely, boiling the goods alternately in alkali and soap, scouring, and then exposing them to the air and sunshine, termed *crofting*. Under this tedious system light fabrics required from six to eight weeks for their completion, while heavy goods often took the whole summer. The use of chlorine as a bleaching agent was first proposed by Berthollet in 1785, and shortly afterwards introduced into Great Britain, where it was first used simply dissolved in water, afterwards dissolved in alkali, and then in the form of *bleaching-powder*, commonly called chloride of lime, the manufacture of which was suggested by Mr. Tennant of St. Rollox, Glasgow, in 1798. At first he passed the chlorine into milk of lime, and thus obtained the solution known as 'bleach liquor'. In 1799 he took out a patent for absorbing chlorine by dry lime, and thus obtained bleaching-powder. Bleaching-powder has little bleaching action till the chlorine is liberated by the action of an acid. The best bleaching-powder contains about 36 per cent of available chlorine; that is, chlorine which is liberated by acid.

In the bleaching of cotton cloth, the pieces, after being singed, by passing them over a red hot plate, or a semi-cylinder of iron or copper, are steeped in lukewarm water, or old lye, until they are com-

pletely soaked, which loosens any paste or filth got during weaving; they are then well washed through the dash-wheel, and put through the hydro-extractor or drying machine. If the cotton is in the hank, this process of steeping and washing is not required.

The mechanical operations of the bleaching-house vary considerably, according to the quality of the goods and the facility for mechanical appliances. In the chemical operations of whitening the cloth there is little variation, further than that heavy fabrics require longer time and more frequent repetition of the processes. The first operation, after steeping and washing, is boiling. The boiling liquor is made by adding a quantity of water to slaked lime, and when the grosser particles of the lime have settled to the bottom of the vessel, the milky liquor is put into the boiler, or it may be filtered through a cloth. Some bleachers use along with the lime a little carbonate of soda; the quantity of lime varies from 4 lbs. to 8 lbs. for every 100 lbs. of cotton, and from 1 lb. to 2 lbs. of soda-ash, where this is used. The boilers used for boiling the goods are called *kiers*, and many kinds are used, the boiling liquid being made to shower over the goods and percolate down through them. This is effected by having a false bottom or frame fitted inside the boiler at about one-third of its depth from the bottom, upon which the goods are laid. The space between the false bottom and real bottom of the boiler is filled with the liquor or lye, connected with which is a pipe leading to the top of the boiler. When the heat is applied, either by steam or fire, and the liquor begins to boil, it is forced up through this pipe, which is made to shower its contents over the surface of the goods. This boiling is continued, according to the quality of the goods, from six to twelve hours. The goods are now removed from the boiler and washed in water; they are then passed through dilute hydrochloric acid, again washed, and boiled for twelve hours with dilute caustic soda, after which they are passed into a solution of bleaching-powder contained in a large stone or wooden trough or cistern, where they are left for from two to four hours.

The bleaching solution is prepared by first dissolving a quantity of bleaching-powder in water, in a large cask, and allowing the whole to settle; a quantity of the clear liquor is then drawn from the cask and put into the large bleaching cisterns, which have been previously nearly filled with water. To ascertain the necessary quantity of this strong bleaching liquor to be added to the troughs or cisterns, a certain measure of sulphate of indigo is taken in a graduated vessel, termed a test-glass, and then, according to the number of graduated measures of the bleaching solution required to decolor the sulphate of indigo, the strength of the bleaching liquor is regulated. These test-glasses and sulphate of indigo are carefully prepared for the purpose.

Instead of dash-wheels, a more improved method of cleaning and washing is adopted by some bleachers previous to boiling the goods. They are all sewed together, end to end, making one line of the whole. This line of pieces is drawn along by machinery between rollers and squeezers, with a plentiful supply of water, and having been thus thoroughly washed and cleaned, is at last laid out, by a mechanical contrivance, into the bleaching trough. The goods are allowed to steep in the bleaching liquor from two to four hours; they are then lifted and washed, either by the dash-wheel or rollers, as before, and are then laid in a *sour*, made by adding about one pint of hydrochloric or sulphuric acid to every four gallons of water. After steeping in the *sour* for four hours, the goods are again washed, as before, and are subjected to another boiling for eight hours; but this

time the lye is caustic soda or potash, generally the former, which is made caustic by boiling together a quantity of soda-ash and slaked lime, and allowing the sediment to settle, and using only the clear solution. About 8 lbs. of soda-ash suffice for 100 lbs. of goods. After the boiling, the goods are again washed and steeped in the bleaching liquor for eight hours, and again washed and soured—the sour in this case being always made with sulphuric acid. Light fabrics require no further treatment; but heavy fabrics need a clearing process, which is a repetition of the last course, the liquors being generally, however, a little weaker, and the processes shorter. Cotton, in the hank, undergoes the same operations, except in the washings, which are performed by hand, not with the wheel. The goods being bleached and dried by the extractor, are now prepared for the operations of finishing. For this purpose they are stretched by women to their breadth, and the folds, as much as possible, taken out by beating them; then they are stretched together by the ends with a sailor's needle, and being thus prepared for the mangle the cloth is now starched, common wheat flour and a portion of porcelain clay being employed. It is then subjected to the action of the stiffening machine, and having been thus impregnated with starch, the superfluous portion of which is pressed out as it passes through the rollers above, the goods are then hung upon rails in an apartment called the stove, heated by two furnaces, from which flues are led through the room. The heat thus generated is sometimes so great that the workmen, in hanging up the cloth, are obliged to throw off the most of their clothes. When the goods are dried thoroughly, they are taken from the stove and carried to the damping machine, where they are subjected to the action of a shower of water. When the cloth comes from the damping machine, it may be seen covered with wet spots, the greater portion, however, being dry; but after remaining some time it becomes uniformly damp. The goods are now passed through the calendar; they are then regularly folded and put into a Bramah press, with a sheet of pasteboard between each, and, being sufficiently pressed, they are then finished for the market.

The process has been greatly shortened by the introduction of the Mather-Thompson process (1884). In this process an important feature is the use of the *steamer-kier*, in which the goods are submitted to the action of low-pressure steam. The material is passed through soda ley, squeezed, and washed; then through boiling caustic soda, squeezed, and run into a steamer-kier, where it is boiled for four hours under a pressure of 4 lbs., washed with hot water, and then passed continuously through a series of vats containing water, bleaching-powder solution, carbonic acid gas, water, alkaline solution, water, bleaching-powder, carbonic acid gas, water, and hydrochloric acid.

The bleaching of linen is conducted after a similar manner to that of cotton; but there is much more colouring matter in the former than in the latter, and it is therefore found necessary in the bleaching of linen to repeat the boiling in lye, and the steeping in chloride of lime, three or four times. An electrolytic method of bleaching (the *Hermite* process) has recently been introduced. The chlorine for bleaching is liberated by the action of an electric current on solutions of calcium or magnesium chloride.

Wool and silk cannot be bleached with chlorine, so sulphur dioxide, usually prepared by burning sulphur, is used instead. In the case of wool, the material is well washed with water and scoured with alkaline solutions to remove fatty matters. It is then exposed, while still wet, to the action of sulphur

dioxide in a brick chamber for six or eight hours—or it may be soaked for several hours in a solution of sulphurous acid—after which it is well washed. Silk is treated with dilute acid, then worked in a soap-bath for about twenty minutes, to remove the gummy matter present, after which it is rinsed, tied up in bags of cotton, and boiled for from one to three hours in water, and rinsed in dilute alkali and finally in water. The bleaching is effected by stoving in sulphur dioxide, exactly as in the case of wool. In place of sulphur dioxide, hydrogen peroxide is coming into use for both wool and silk bleaching.

BLEACHING-POWDER. See preceding article and **CHLORINE**, also **LIME**.

BLECHNUM, a genus of plants, belonging to the natural order Filices or ferns, sub-order Polypodeæ. It has been found in North Africa and North America, occurs in every European list of plants, and is very common throughout Great Britain, though only in the single species of *B. boreale* (also called *B. epianum*) or hard fern.

BLEEDING. See **HEMORRHAGE**, **PHLEBOTOMY**.
BLEMMYES, or **BLEMYES**, a people of ancient Ethiopia, who for several centuries after Christ gave much trouble to the Romans during their occupation of Northern Africa.

BLÉNDE See **ZINC**.

BLENHEIM, or **BLINDHEIM**, a village situated in the circle of the Upper Danube, in Bavaria, on the Danube. Here was fought, August 13, 1704, the famous battle of Blenheim (or, as it is more commonly called on the European continent, the battle of *Zbechtstadt*, from another village of this name in the vicinity), in which Marlborough and Prince Eugene, commanding the allied forces of England and the German Empire, gained a brilliant victory over the French and Bavarians. The latter armies were drawn into the engagement under the most unfavourable circumstances. Both these armies were posted, under the command of Tallard, Marsin, and the Elector of Bavaria himself, between the village of Blenheim and that of Kinzingen, behind the Nebelbach, a small stream emptying into the Danube, which was on their right flank. They amounted to 56,000 men, whilst the forces of Marlborough and Eugene were about 52,000. The first had thrown their troops chiefly into the two villages, which they considered as points of support for their wings, though they were at too great a distance in front of their main position. A large proportion of cavalry was in the centre, since each army, the Bavarian as well as the French, had their horse on their wings, and in this way those of two wings must necessarily join each other. Both the commanders would undoubtedly have perceived and corrected this mistake, as Tallard had in Blenheim alone twenty-seven battalions of infantry; but they expected so little to be attacked, that when the line of the allies began to move, August 13, at two o'clock in the morning, they supposed them to be marching off. The greatest part of their cavalry was sent to forage. Even at seven o'clock, when the heads of the right columns with which Eugene and Marlborough advanced towards the Nebelbach were to be seen, Tallard thought the whole a stratagem intended to cover the retreat; but he soon saw his error. The dispersed troops were recalled in the greatest hurry, and the cannon were drawn up in line. The French and Bavarians made every exertion to prevent the passage of the enemy over the Nebelbach, and the capture of the two villages, the conquest of which was considered, by Marlborough and Eugene, as decisive. Their line of attack was uncommonly long, about 4½ miles. Marlborough, in order to secure his right wing, attacked

Blenheim, but without success: he then changed his plan, and threw himself, with his principal forces, into the wide interval between the right wing and the centre of the enemy, leaving only as many troops before Blenheim as were necessary to check the body which occupied this position. At five o'clock in the afternoon he succeeded, after great efforts, in passing the Nebelbach, by which his victory was decided. Tallard himself was among the prisoners; his son was killed. The consequences of the battle were decisive. Bavaria, as Marlborough had anticipated, fell into the power of Austria. Fortune deserted Louis XIV., as it did Napoleon after the battle of Leipzig, and though he was able to continue the war for almost ten years longer, it was owing to the dissensions among the allies themselves, who contended about the best use of the victory till the opportunity to use it was lost.

BLENHEIM, the name of the demesne bestowed by national gratitude on the Duke of Marlborough, is situated in the parish of Woodstock, and county of Oxford. The estate of Woodstock, which had for many centuries belonged to the crown, having been conferred by Queen Anne on that great commander for his eminent services, Parliament granted the sum of half a million sterling to erect a suitable family seat. The building was intrusted to Sir John Vanbrugh, and called Blenheim, from the village where the duke gained his great victory. The grand seignior by which the manor is held, consists in the presentation at Windsor Castle on each anniversary of that event, by the Duke of Marlborough and his descendants, of a flag embroidered with *fleurs-de-lis*. In this park once stood the royal palace of Woodstock, where Alfred is said to have resided, and which was the favourite residence of Henry II., who erected a house in the park for his favourite mistress, Rosamond Clifford, whence the well-known legend of Woodstock-bower, Queen Eleanor, and the Fair Rosamond. Here the same monarch received the homage of Malcolm, king of Scotland, and Rhys, prince of Wales. Edward III. was also much attached to this palace, in which his eldest son, the illustrious Black Prince, was born, as well as his youngest son, Thomas, duke of Gloucester, usually called Thomas of Woodstock, from that event. Richard II. likewise kept his court here, at which time the poet Chaucer resided at Woodstock, in a house which stood near the present entrance to the park. When alarmed by the conspiracy of Sir Thomas Wyatt, Queen Mary placed her sister the princess, afterwards Queen Elizabeth, in the palace at Woodstock, under the superintendence of Sir Henry Bedenfield. During the civil wars of the seventeenth century it was for some time defended for the king; but it ultimately surrendered, and was much injured and dilapidated by the Parliamentarians. The gate-house remained, and was tenanted so late as the reign of William III., and existed until the commencement of the last century, when the whole was removed.

The usual approach to Blenheim from Woodstock is through a triumphal arch or portal, from which the advance to the mansion is very fine. In front of the building stands a sculptured column 130 feet high, surmounted by a statue of the duke, whose victories and achievements are recorded on tablets round the base. The front of the house measures 348 feet from wing to wing, and although architectural critics find many faults in detail, the general effect is in the highest degree noble and commanding. The interior is also extremely magnificent; the hall, which is supported by Corinthian pillars, is 67 feet high; and the ceiling was painted by Sir James Thornhill, the design representing Victory crowning the duke. The gallery and bow-window room abound in portraits by

the most eminent masters, both foreign and English. On the tapestry of the latter are figured the various battles gained by the same great general, and more especially that of Blenheim. The saloon is a noble and spacious apartment, which communicates with the hall, and occupies the entire breadth of the centre. The lower part is lined with marble, and six of its compartments are decorated with pictures by La Guerre, representing the inhabitants of the different nations of the world in appropriate costume. On the ceiling is a representation by the same artist, of the victorious duke arrested in his career by Peace and Time. The remaining principal subjects of admiration are the library, the theatre, the state drawing-room, the blue and green drawing-room, the grand cabinet, the dining-room, &c. Many of the treasures of Blenheim have latterly been sold, including the splendid Anselmi Madonna of Raphael, acquired by the National Gallery for £70,000. In the chapel, which forms one of the wings, is a fine marble monument by Rysbrack, to the great duke and his almost equally celebrated duchess, Sarah. The gardens and grounds, which are exceedingly spacious, were laid out by Brown, who contrived to make a most admirable use of the small river Glymo in the formation of a lake, or piece of water, which is justly deemed one of the greatest beauties of the place. It is crossed by several arches, and at the middle or grand approach is a magnificent bridge, the span of the centre arch of which is 101 feet.

BLESSING, or BENEDICTION. The expression of wishing one well soon gave rise, in early ages, to a solemn act, accompanied, like other solemnities of those periods, by symbolic signs; this was the *blessing or benediction*. In the patriarchal times, when the authority of the head of a family included that of the priest and the civil ruler, the blessing of course appertained chiefly to him, on account of his venerable character, and when the priests began to form a separate class, became, in certain cases, a prerogative of theirs. As the authority of the father, in the infancy of every nation, is extremely great, the idea soon sprung up that his prayers, invoking the favour of the Deity, were more effectual than those of others, and that whatever he blessed would be likely to receive the favour of God. The same importance was soon attributed to blessings conferred by a priest. The heathens, the Jews, and many Christian sects, have cherished this idea. By the Jewish institutions, certain benedictions were reserved to the priest: the same is the case in the Roman Church, in which different benedictions are appropriated to different degrees of the clergy. We shall mention only a few of them. The Catholic bishops alone can confer those benedictions which are connected with unction, and are called *consecrations*, as, for instance, the consecration of kings and queens, of the cup and *patena*, the church and altar. To them also is confined the benediction of abbots and abbesses, of knights, and the holy oil. For the benediction of the holy vestments, &c., they may employ a substitute. Every Catholic clergyman may confer the benediction on the occasion of betrothment; also the marriage benediction; may bless the fruits of the earth, and the holy water. The benediction of a bishop is eagerly sought for by a faithful Catholic, as contributing peculiarly to his spiritual welfare; and the Catholic clergy, in general, use the benediction as a salutation, or reward for a service, &c. When the pope rides or walks out, the Catholics kneel to receive his blessing, which he gives by a motion of his hand. In his ante-chamber are often seen things of different kinds, *rosaries*, &c., in large quantities, which he blesses in passing by. The Catholic Church blesses things animate and inani-

mate, and this is believed by many to preserve them from sickness, injury, &c. (See AGNES, ST.) Among most Protestant bodies there is a blessing pronounced upon the people at the close of a religious service, that of the Church of England being contained in the Prayer Book. R. Catholics in many cases use the consecrated water in giving the benediction.

BLESSINGTON, MARGARET, COUNTESS OF, was born at Knockbri, near Clonmel, Ireland, on 1st Sept. 1789. She was the third daughter of Mr. Edmund Power, an improvident man of good family, and at the age of fifteen was married to a Captain Farmer, but the union was a very unhappy one. He died in 1817, and a few months after his death, his widow married Charles John Gardiner, earl of Blessington. In 1822 they went abroad together, and continued to reside on the Continent till the earl's death at Paris in 1829. On that event taking place, Lady Blessington returned to London, and took up her abode in Gore House, Kensington, which had been bequeathed to her by her husband. Here for many years she held those celebrated reunions and soirees, at which the most distinguished literary characters in London were wont to assemble. The fascination of her manners and conversation, with her genial warm-heartedness of character, rendered these gatherings most attractive; but certain equivocal circumstances in relation to her connection with a Count d'Orsay prevented their being frequented much by respectable female society. The count had married a daughter of Lord Blessington by his first wife, and been separated from her shortly afterwards, but after the death of his father-in-law, resided with the countess during the remainder of her life. Lady Blessington had made her *début* as an authoress in 1822 by the publication of two volumes of Sketches. In 1832 she contributed to the New Monthly Magazine, Conversations with Lord Byron, considered by many as the best of her productions. She also wrote numerous novels, including, among others, *The Belle of a Season*, *The Two Friends*, *Strathorn*, and *The Victims of Society*. None of these have much literary merit, but describe scenes in fashionable life with considerable power, and enjoyed at the time a large share of popularity. She acted as editress, for several years, of Heath's Book of Beauty and the Keepsake, and also of another annual, the *Gems of Beauty*. In 1849 she proceeded to Paris, whither Count d'Orsay had previously gone, in the hope of obtaining an appointment under Louis Napoleon, with whom they had been intimate during his exile in England. She died suddenly there, on the 4th of June of that year.

BLIGH, WILLIAM, a navigator who has acquired considerable celebrity, from having been the commander of the ship *Bounty* when the crew mutinied in the South Seas and carried her off. She had been fitted out for the purpose of procuring plants of the bread-fruit tree, and introducing these into the West Indies. Bligh, who had sailed with Captain Cook, obtained the command, and in December, 1787, left Spithead for Otaheite, where he arrived, and remained till April, 1789. Having loaded his vessel with plants, he set sail, and was proceeding on his voyage for Jamaica when he was seized in bed, bound, and brought on deck. The launch was lowered, and Bligh, with eighteen men supposed to be well affected to him, were forced into it, with no other provision than 150 lbs. of bread, 32 lbs. of pork, a little rum and wine, and 28 gallons of water. Thus scantily provided they found themselves in the open sea, not far from the island of Tofua, in lat. 19° s. and lon. 184° w., and managed, by admirable skill and perseverance, though not without enduring fearful hardships, to reach the island of Timor in forty-one days, after running nearly 4000 miles, without the loss

of a single man. Ultimately twelve of the number reached England. Of these Bligh was one, and in a second voyage accomplished the object of the first by giving the bread-fruit tree to the West India Islands. This is not the place to detail the future history of the mutineers; but when several of them were afterwards tried at Portsmouth, sufficient evidence was led to show that Bligh himself was not free from blame, and had on many occasions been too much inclined to play the tyrant. This feature in his character was afterwards manifested on a larger scale. In 1805 he was appointed governor of New South Wales, and acted so harshly that the other authorities interfered and put him in confinement. On his return he was made an admiral, and died in 1817, aged sixty-three. See FITZPATRICK ISLAND.

BLIGHT, a generic name commonly applied to denote the effects of disease or any other circumstance which causes plants to wither or decay. It is usually considered as arising from the atmosphere, and to be extremely sudden in its operations, but this popular notion must be allowed to be fallacious, for close observation will generally show that the mischief has been some time in progress. Peculiar conditions of the atmosphere may have concurred to increase the malady, so as to cause it to attract at a particular period general observation; but that is a different point, and one the force of which it is easy to appreciate. These observations are applicable to different forms of mildew, rust, the ravages of minute moulds, and of some destructive insects; but doubtless there are phenomena in the vegetable world dependent on cosmical conditions, which may properly be considered blight, according to the popular notion of the phrase. These arise sometimes directly from drought, especially on stiff clay land, accompanied more or less by weakness of constitution, or from want of vigour or maturity in the seed. It is not unusual to see in a corn-field, where the greater part of the crop is healthy, certain plants in greater or less abundance, which, from the very first, betray a want of constitution by their pale and consumptive aspect. This occurs not only in the cereal crops, but also in other plants which occupy the attention of the agriculturist. There is no fungus nor insect at work, but the seeds of consumption are deeply seated, and seldom fail to break forth ere the plant attain maturity. Sometimes the blight assumes the form of dark charred patches on the leaves or stem, which in some instances arise from the presence of parasitic fungi, but frequently exhibit no traces of them. Sometimes, under every advantage of good cultivation, and without any fault in the seed, crops will still wear a blighted aspect. This arises usually from the balance of circumstances favourable to healthy vegetation not being kept up; and on their restoration to an equilibrium, unless the untoward conditions have been too long maintained, all is right again. There are some forms of blight which it is extremely difficult to understand, but which seem connected in greater or less degree with the attacks of aphides. In these cases, as in the peach-tree, the tender tissues of the leaves are preternaturally developed, and in consequence the leaves are curled and bloated, and ultimately nourish a host of plant-lice. In some cases it is uncertain whether the succulent leaves attract the aphides, or whether the hypertrophy itself does not arise from the puncture of an insect. It must also be mentioned that there is frequently not a trace of aphides where a tree is one mass of deformity from its curled and bloated leaves. Finally, there is a kind of blight sometimes very prevalent, which has been referred to fungi, but which is, in fact, nothing more than an excessive development of the epidermal cells, which are no

longer kept within bounds by the real cuticle. This is very common in vines, and the leaves of the hawthorn are frequently distorted and crumpled by them, especially at the margin. It is probable that in such cases no material injury occurs to the plant, further than diverting the energies which should be employed in producing seed.

BLIND, THE. The loss of the noblest sense, by means of which man receives an idea of the world that surrounds him, clothed in light and colour, is an event as melancholy as it is frequent. Blindness is different, 1. In its degrees, some persons being partially blind, retaining a slight perception of light, with the power of distinguishing very brilliant colours, and the general outlines of bodies; others being entirely deprived of the faculty of seeing; 2. In its causes: some men are blind from their birth; others have become blind by local diseases of the eyes, for instance, by inflammation, suppuration, cancer of the eye-ball, spots, films, tumours on the cornea (by which its transparency is destroyed), also by closure of the pupil, by a turbid state of the humours, by a debility of the optic nerve, or by general diseases of the body, violent fevers, nervous fevers, plethors, and tendency of the blood to the head, erysipelas in the face, small-pox, scarlet-fever, &c., or by excessive exertion of the eyes, by which the optic nerve is enfeebled; for which reason, some classes of mechanics and artists, as blacksmiths, labourers in glass and melting-houses, watch-makers, &c., not unfrequently lose their sight, and in northern countries, which are covered with snow for a long time, and which dazzle the eyes by the reflection of the sunbeams, as well as in the sandy deserts of Africa, blindness is a frequent complaint. Old age is sometimes accompanied with blindness, occasioned by the drying up of the humours of the eye, or by the opacity of the cornea, the crystalline lens, &c. There are several causes which produce blindness from the birth. Sometimes the eyelids adhere to each other, or to the eye-ball itself, or a membrane covers the eyes; sometimes the pupil of the eye is closed, or adheres to the cornea, or is not situated in the right place, so that the rays of light do not fall in the middle of the eye; besides other defects. Those who are born blind have no idea of vision, and are entirely destitute of all the ideas derived from the sense of sight. They cannot, therefore, be sensible of their misfortune in the same degree as those who have lost their sight at a later period. Experience has shown that those who acquire the power of seeing after being born blind, or having lost their sight in their childhood, form very different ideas of visible objects from other persons. A young man, whom Cheselden couched for a cataract, at the moment he received sight imagined that all the objects which he saw were in contact with his eyes: he could not distinguish objects, although of very different forms. Those with which he was already familiar by the touch he examined with great attention, in order to recognize them another time; but having too many things to notice at once, he soon forgot all that he had observed. He wondered that those persons whom he loved most were not handsomer than others. Before he received his sight he had expressed a great desire to obtain this sense. The other senses of persons, who have been blind for a long time, become more exquisite, perhaps, because they are not subject to the distraction produced by the sight of so many objects. The blind, therefore, are often distinguished for a remarkable mental activity, and a wonderful development of the intellectual powers. Their touch and hearing, particularly, become very acute. Thus it is related of a blind man, who lived at Pulaux, in France, and was a chemist and musi-

cian, that he could accurately estimate the proportions of objects, could judge of the distance of fire by the degree of heat, determine the quantity of fluid in vessels by the sound it produced while running from one vessel into another, and the proximity of objects by the effect of the air upon his face. He determined very accurately the weights of bodies and the capacities of vessels. The celebrated Saunderson, professor of mathematics at Cambridge, lost his sight in his early youth. He invented several processes to facilitate his studies in arithmetic and geometry. His sense of touch was so acute, that he distinguished spurious coins merely by letting them pass through his fingers, though they were so well executed that even skilful judges were deceived by them.

When it is a case of imparting instruction to persons destitute of sight, it is necessary to have recourse to the other senses to supply the want of the eye. If, for instance, we wish to teach them the arts of reading and writing, letters must be prepared which will be palpable to the touch, and the hand guided until they are able to copy them. If we wish to communicate to them a knowledge of the surface of the earth, globes and maps must be prepared with the divisions, &c., in relief. Knowledge obtained in this way must, of course, be acquired much more slowly than that received by the sight. The senses of touch and of sight differ in this respect, that the former ascends by degrees from the perception of parts to the perception of the whole, whilst the latter views the whole at a single glance. It is therefore evident that the blind cannot be instructed in the common schools destined for those who see: in the first place, because the means of instruction by touch are wanting; and secondly, because the progress of the other children would be retarded by the slow apprehension of the blind pupils. For these reasons, and as the blind form no small part of the pop. of every country, particular institutions have, in many places, been established for their instruction. In the United Kingdom their number is about 32,000. Relatively to the total population the number of the blind is decreasing, the proportion for England and Wales in 1851 having been 1021 per million, as against 809 per million in 1891. Greater care and improved treatment would account for this. A comparatively small number of persons are blind from birth.

The instruction given in the schools for the blind aims, first, at imparting a knowledge of elementary subjects and a general cultivation of their intellectual faculties. They are afterwards taught some art or occupation which may enable them to provide for their own subsistence. The instruction of the blind, besides elementary education, embraces three branches—1, mechanical labours; 2, music; 3, science; and it is impossible to determine, without trial, the peculiar genius of the pupils, whether, for instance, they should be instructed as mechanics, musicians, or mathematicians. The German institutions for the blind, as well as those in France, have this comprehensive character, whilst the English aim, more commonly, to impart instruction in mechanical trades. The first idea of such an institution for blind persons was conceived by Valentin Haüy, brother of the celebrated mineralogist: it was suggested to him by his acquaintance with a blind German lady, the Baroness von Paradis, of Vienna, who visited Paris in 1780, and performed on the organ with general applause. Haüy repeatedly visited this ingenious lady, and was much surprised to find in her apartments several contrivances for the instruction of the blind; for instance, embroidered maps and a pocket printing apparatus, by means of which she corresponded with Von Kempelen in Vienna (the inventor of the chess-player and speaking automaton), and

with a learned blind gentleman named Weissenburg at Mannheim. Haüy compared the high cultivation of these two Germans with the degraded state of the blind in France. Even the great institution for the blind, the 'hospital of the 300' (commonly called *Les Quinze-vingts*, founded in 1260 by St. Louis, after his crusade to Egypt, during which so many soldiers became blind by the ophthalmia prevailing in that country), did not present to the philanthropic Haüy a pleasing picture of intellectual cultivation, but rather one of dullness and moral inferiority. He therefore resolved to do for the blind in France what the Abbé de l'Épée had done for the deaf and dumb. In 1784 he opened an institution in which they were instructed not only in appropriate mechanical employments, as spinning, knitting, making ropes, &c., but also in music, in reading, writing, ciphering, geography, and the sciences. For this purpose he invented particular means of instruction. For teaching reading he procured raised letters of metal, from which also impressions might be taken on paper: for writing he used writing-cases, in which a frame, with wires to separate the lines, could be fastened upon the paper: for ciphering there were movable figures of metal, and ciphering-boards in which the figures could be fixed: for teaching geography maps were prepared upon which mountains, rivers, cities, and the borders of countries were embrodered in various ways, &c. In the beginning the Philanthropic Society paid the expenses of twelve blind persons; afterwards, in 1791, the institution was taken under the protection of the state, and united to that for the deaf and dumb; but as this was found inconvenient, it was, in 1795, separated from the latter, and in 1801 united to the hospital of the *Quinze-vingts*, from which it was again separated in 1814. As the Institution des Jeunes Aveugles it has long been the chief school for the blind in France. Connected with the *Quinze-vingts*, besides the 300 maintained in the establishment there are over 1500 out-pensioners, who live in their own homes.

Next to France, the first institutions for the blind were established in Great Britain, where, however, they were for long supported only by the contributions of private individuals. In 1791 an institution of this sort was established at Liverpool, in which both males and females are instructed in manual labour, in singing, playing, &c. In 1793 a second was established in Edinburgh, which has all along been managed with great judgment and success. Similar institutions have since arisen in other places: one at London in 1799, others at Dublin, Glasgow, Bristol, Norwich, &c. The total number of institutions for the blind in Britain is now over sixty, of which nearly one-half are both schools and industrial institutions. Some of the larger school-boards have lately undertaken the education of blind children. In 1872 the Royal Normal College and Academy of Music for the Blind was established at London. It embraces a preparatory school, a grammar and high school, and a technical school, as well as an academy of music. Teachers are trained and pupils prepared for university examinations. It is carried on by means of voluntary subscriptions. Several institutions for the blind have also been established in the colonies.

In Germany the first public institution for the blind was established by the King of Prussia at Berlin, in 1806, when Haüy passed through this city. Zeune was appointed director of it. He invented many instruments more simple than those which had formerly been used, and which answered the purpose very well. Among other things, he brought to great perfection maps and globes, destined for the use of the blind, which, in many parts of Europe, are used for the instruction of others also, since they present, by means

of elevations and depressions of the surface, proportional elevations and pictures, which strike the mind forcibly. Those in Vienna and Prague were both established in 1808, and in the same year that in Amsterdam, founded by Freemasons. In 1809 the institution in Dresden sprang up—a branch of that in Berlin. Germany has now between thirty and forty such institutions. In 1810 the institution in Zürich was founded. In 1811 a similar establishment was instituted in Copenhagen. After the great war for liberty from 1813 to 1815, when the disease of ophthalmia raged so dreadfully among the European armies, several institutions for blind soldiers were established on Zeune's plan in Prussia. Their object was to instruct soldiers who had become blind and unable to exercise their former business in useful labour. These schools were at first intended to continue only till all the soldiers received in them had thoroughly learned some trade. Two of them, however, those at Breslau and Königsberg, were put upon a permanent footing. The institution for the blind in St. Petersburg, which was founded by Haüy, though not very prosperous for some time, has led to the establishment of many other similar institutions not only in St. Petersburg but also in other parts of Russia. Institutions for the blind are found in most civilized countries, there being now comparatively few large cities that do not possess a school or institution of some kind for the blind. The first institution of the kind in America, where there are now over forty, was commenced in Boston in the year 1829. They now form part of the educational system of the several states.

The occupations in which the blind are found capable of engaging are such as the making of baskets and other kinds of wicker-work, brushmaking, rope and twine making, the making of mats and matting, knitting, netting, fancy work of various kinds, cutting fire-wood, the sewing of sacks and bags, the carving of articles in wood, &c. Piano-tuning is also successfully carried on by some, the typewriter is used by others, and the cleaning of clocks and watches has also been occasionally practised by them. Skilled musicians are sometimes found among the blind.

Various systems have been devised for the purpose of teaching the blind to read. Haüy, in his above-mentioned institution for the blind in Paris, taught them by means of the script or italic form of the Roman letters printed in raised characters so as to be felt by the fingers. This system was introduced into England in 1832 by Sir C. Lowther. Becoming acquainted with the system, Mr. James Gall, Edinburgh, endeavoured to improve upon it by replacing all the curves in the ordinary Roman small letters by angular lines. Subsequently he introduced various improvements, chief among which was the use of serrated types by which the printed letters were formed of dots instead of lines. In this form he printed the Gospel of St. Luke and the Acts of the Apostles. The angular modification of the common alphabet was also adopted by Dr. Howe of Boston after a visit to Scotland, and in this he published the New Testament in 1836. Four years later the whole Bible was printed by Mr. John Alston, Glasgow, who adopted Roman capitals. Of alphabets used by the blind, and differing from the Roman letter, one consists of a stenographic shorthand, invented by Lucas of Bristol in 1838, another of a phonetic system introduced in the same year by Mr. Frere of London. These various forms, however, have been largely superseded by the system adopted by Dr. Moon of Brighton, the alphabetic characters of which are Roman letters, characters based upon Roman letters, and arbitrary signs. Since he began to print in 1847 he has published portions of the Bible in 346 languages and dialects, and circu-

lated an immense number of volumes embossed in this special type. Another important system was introduced into the Institution Nationale des Jeunes Aveugles in 1854, the inventor of which was Louis Braille. This consequently is known as the Braille system, and its alphabet, which is quite arbitrary, consists of six points or dots arranged in an oblong form (::), and the sixty-two possible combinations of which these six points are capable, the characters consisting of from one to the full six points, and one or more of the places in the oblong being always empty, except in the case when the six are used. Reading is also made speedier by the use of simple contractions. Writing in this system may be performed by means of a frame or contrivance consisting of a grooved metal plate over which is fitted a brass guide perforated with small oblong holes. The paper is placed between the grooved plate and the punched guide, and the writing consists of a series of little pits stamped on the paper by means of an instrument, these pits being represented by prominences on the other side of the paper, which may be felt by the fingers and thus read. The guide has two rows of openings, and thus enables the blind person to write two lines, after which it is shifted downwards for the next two, and so on. In England an improved writing-frame has been introduced with a bed marked by groups of six small pits instead of the grooves, the guide having similar perforations, which enable the characters to be formed by an instrument. In writing the hand moves from right to left, in order that when the paper is reversed the reading may be from left to right. In America a modification of the Braille character is in use, known as 'New York point'. In this the dotted oblong is horizontal instead of upright. A simple system of musical notation has been based on the Braille type. The Braille system has been very widely adopted in British schools for the blind, as well as in America and else where, and the honorary secretary of the British and Foreign Blind Association claims that 'more books have been published in the Braille system, either in print or embossed by hand, by the association, than exist in all other systems put together'.

BLIND-WORM, or SLOW-WORM (*Anguis fragilis*), an interesting little reptile belonging to the skink family (Scincidae), and forming a connecting link between the lizards and the snakes. It is perfectly snake-like in form, having no appearance of external limbs, but the bones of the shoulders and pelvis exist in a rudimentary form. Its average length is about a foot, and it is of nearly equal thickness throughout, but rather more slender towards the tail, the tip of which is abrupt. The colour of the upper surface is brownish gray, with a silvery gloss, and there are several rows of obscure dark dots running down the sides, and a black line down the middle of the back. The under parts are bluish black. Its eyes, though brilliant, are small, and hence it has received its common English name. It is found in every part of Great Britain, though not in Ireland, and is spread over almost the whole of Europe, Western Asia, and Northern Africa. Though it is usually considered by the country people to be highly venomous (Shakespeare calls it the 'cress venom'd worm,' and speaks of 'the blind-worm's sting'), no creature is more harmless than the blind-worm. It rarely attempts to bite, and when it does the smallness of its teeth prevents it from making almost any impression on the skin. It receives its specific name of *fragilis* from the fact that when frightened it stiffens its muscles to such an extent, and becomes so rigid, that its tail may be snapped off by a slight blow, and very often fright alone causes the animal to leave this member behind it. It passes the winter in a state of in-

senability, generally burrowing into the soft earth to the depth of 3 or 4 feet, for the purpose of hibernating. In summer it may frequently be seen on a sunny bank, or beneath a hedge, basking in the sun. Its food consists of insects, earth-worms, slugs, &c. It is one of those reptiles that are ovo-viviparous, that is, whose young are hatched from the egg in the body of the parent before being brought into the world.

BLISTER, a topical application which, when applied to the skin, raises the cuticle in the form of a vesicle, filled with serous fluid. The powder of the *cantharis*, or Spanish fly, operates with most certainty and expedition, and is commonly used for this purpose, as well as mustard, hartshorn, &c. Morbid action may often be removed from the system by inducing an action of a different kind in the same or a neighbouring part; hence the utility of blisters in local inflammation and spasmodic action. Exciting one pain often relieves another; hence the use of blisters in toothache, and some other painful affections. Lastly, blisters communicate a stimulus to the whole system, and raise the vigour of the circulation; hence, in part, their utility in fevers of the typhoid kind, though, in such cases, they are used with still more advantage to obviate or remove local inflammation.

BLITUM, a genus of plants belonging to the natural order Chenopodiaceæ. Two of the species are known by the name of the strawberry blite, because, after flowering, the calyx spreads out, and bears, in size, colour, and general appearance, a strong resemblance to the common wood strawberry. They are of no economical importance, but yield a colouring matter which was formerly used in cookery. Though not natives of Great Britain, they are common weeds in the s. of Europe.

BLUCH, MARCUS ELIEZER, a naturalist of Jewish descent, born at Anspach in 1728, of poor parents. In the nineteenth year of his age he understood neither German nor Latin, nor had he, with the exception of some rabbinical writings, read anything. Nevertheless he became tutor in the house of a Jewish surgeon in Hamburg. Here he learned German and Latin, and besides acquired some knowledge of anatomy. His principal work is the *Naturogeschichte der Fische* (Natural History of Fishes), folio, 1785-1799, which is adorned with many coloured plates. He enjoyed a well-deserved reputation, and died in 1799.

BLOCKADE is the interception by one belligerent of communication with a place occupied by another. National sovereignty confers the right of declaring war, and the right which nations at war have of destroying or capturing each other's subjects or goods imposes on neutral nations the obligation not to interfere with the exercise of this right within the rules and limits prescribed by the law of nations. In order to render the communication with a place unlawful to a neutral, a blockading or besieging force must be actually present, investing it, and sufficiently powerful to render a communication with it dangerous to a neutral, and expose him to seizure by the blockading or besieging force. A declaration of siege or blockade is an act of sovereignty, but does not require, in all cases, a direct declaration by the sovereign authority of the besieging belligerent; for its officers may be invested, either expressly or by implication, with authority to institute such siege or blockade. It must, however, in order to be lawful and obligatory on neutrals, be declared or sanctioned, either expressly or by implication, by the sovereign power. It must also be declared or made public, so that neutrals may have notice of it. If a blockade is instituted by a sufficient authority, and maintained by a sufficient force,

a neutral is so far affected by it, that if he attempts to trade with the place invested, either by carrying goods to it, or bringing them away, the property so attempted to be carried to or from the place is liable to be seized by the investing party, and in case of being seized is forfeited.

BLOCKHOUSE, in fortification, a house made of beams joined together crosswise, and often doubled, with a covering and loopholes, large enough for from 25 to 100 men. In addition to this, it is commonly covered with earth, to render it entirely bomb and fire proof. It is usually sunk several feet into the ground. Some forts of this kind contain two stories; and they are often fitted up to receive cannon. Blockhouses are generally built in the form of a square or a cross. Their use is to afford a feeble garrison of an important place, which is very much exposed, an opportunity of holding out against the cannonade and assault of the enemy till they are relieved. They also serve for bomb-proof guard-houses, and places of last resort, in the interior of intrenchments, and in the covered passages of fortresses, where the cannon are stationed.

BLOCKS are pieces of wood in which sheaves or pulleys are placed, for the purpose of forming tackle, purchases, &c., in various operations in naval tactics and architectural constructions. The mechanical power is described in article **MECHANICS** (which see). Blocks are single, double, treble, or fourfold, according as the number of sheaves is one, two, three, or four. The sheaves are grooved to receive the rope, and have in their centre a brass *brush*, or triangular piece of brass, to receive the *pin* on which they revolve. The sides of the block are called *checks*. A *running* block is attached to the object to be moved; a *standing* block is fixed to some permanent support. Blocks also receive different denominations from their shape, purpose, and mode of application, which cannot well be explained without the use of figures. No less than 200 different sorts and sizes are made at Portsmouth, England, for the royal navy, besides which there are various sorts used only in the merchant ships. The machinery for supplying the royal navy with blocks is the invention of Mr. (afterwards Sir Mark I.) Brunel. It enables four men, in a given time, to complete the shells of as many blocks as fifty men could do by the old method; and the blocks produced by the machinery far surpass in make those produced by the hand. Iron blocks and sheaves have been introduced both into the naval and the merchant service with great success.

BLOEMAART, sometimes also called **BLOM**, **ABRAHAM**, a Dutch painter, born at Gorkum about 1665, died at Utrecht in 1687, or according to others, but less probably, in 1647. His paintings are reproached with various faults, yet he is distinguished by the brilliancy of his colouring and the richness of his invention. He painted all sorts of objects, but his landscapes are the most esteemed. He had four sons, of whom Cornelis, born at Utrecht in 1603, died at Rome in 1680, was a distinguished engraver.

BLOEMFONTEIN, the chief town and seat of government of the Orange River Colony, South Africa, 450 miles by rail north from Port Elizabeth. It stands on a plain 4500 feet above sea-level, and is a pleasant, well-built place, with handsome public edifices, &c. See SUPP.

BLAIS (anciently *Blesum*), the capital of the French department Loir-et-Cher, 99 miles s.w. of Paris, is beautifully situated on the right bank of the Loire, from which it rises in the form of an amphitheatre. It consists of an upper town, with very narrow and crooked streets; a lower town, with many handsome houses, extending along a handsome quay; and of several suburbs, with one of which it com-

municates by a stone bridge of eleven arches. P. 21, 077. The Castle of Blais is rich in historical associations. It was long occupied by the counts of the name, and became a favourite residence of the Kings of France. Louis XII. was born, Francis I., Henry II., Charles IX., and Henry III. held their courts in it; and the Guises, by a cruel though not unjust retribution, were murdered in it.

BLOMFIELD, **CHARLES JAMES**, Bishop of London, a prelate of great learning and zeal in promoting the interests of religion, was the son of a school-master at Bury-St. Edmunds, Suffolk, and born there in 1786. He studied for the church at Cambridge, where he took high honours; and after filling successively several curacies, and acting for a time as chaplain to the Bishop of London, was promoted to the rectory of St. Botolph, Bishopsgate. In 1824 he was made Bishop of Chester, and in 1828 Bishop of London. He acquired considerable renown as a classical scholar from the editions published by him of several of the dramas of *Æschylus*, and he also published an edition of *Callimachus*, which is much esteemed. Along with Kennel he edited, in 1812, the *Musa Cantabrigiense*, and in 1814, along with Monk, the *Posthumous Tracts of Porson*, followed two years afterwards by the *Adversaria Porsoni*. In his ecclesiastical capacity he displayed great zeal and energy, more churches having been built in London under his episcopate than under that of any bishop since the Reformation. He incurred, however, some animadversions on his proceedings in relation to the Tractarian controversy by a vacillating policy, which gave satisfaction to neither of the parties. He died at Fulham, on 5th August, 1857.

BLOMFIELD, **EDWARD VALENTINE**, brother of the preceding, was born in 1788, studied in Caius College at Cambridge, and excited the highest expectations. Among several prizes which he received, we may mention the medal assigned him in 1809 for his beautiful ode *In Desiderium Porsoni*. In 1812 a fellowship in Emmanuel College was conferred on him. In 1813 he visited Germany, where he acquired a good knowledge of the German language, and became acquainted with Wolf in Berlin, and Schneider in Breslau. After his return he wrote in the *Museum Criticum*, or *Cambridge Classical Researches*, remarks on German literature, which were received with approbation. The University of Cambridge appointed him one of the preachers of St. Mary's Church. He began a translation of Schneider's *Griechisch-deutsches Lexicon*, but did not live to finish it. Matthias's *Griechische Grammatik*, however, he translated completely. His translation was published by his brother, and everywhere well received. He was in Switzerland in 1816 with his pupil, a young nobleman, and in his haste to return to Cambridge, on hearing that he was appointed proctor for the following year, the fatigue of rapid travelling occasioned a sickness of which he died in October, 1818.

BLONDEL, a confidential servant and instructor in music of Richard Cœur de Lion of England, about the year 1190. While his master was the prisoner of the Duke of Austria, Blondel went through Palestine and all parts of Germany in search of him. He understood, it is said, that a prisoner of rank was confined in Lowenstein Castle, and hastened thither. Placing himself under a grated tower, he began to sing one of the French lays which he had formerly composed for Richard. Scarcely had he finished the first stanza, when a voice from the dungeon of the tower responded. Thus he discovered his king, delivered him, and gained the name of the *faithful Blondel*. Grétry's fine opera, *Richard Cœur de Lion*, is founded on this anecdote.

BLOOD is the red fluid contained in the blood-vessels of animal bodies. It is found in the mammals, in birds, in reptiles, and in fishes. In the last two classes of animals the temperature of the blood is much lower than in the former, for which reason they are distinguished by the name *cold-blooded*, while the others are termed *warm-blooded* animals. Insects and worms, instead of red blood, have a juice of a whitish colour, which is called *white blood*. In the blood two different substances are contained, which are separated by coagulation—the *serum*, a fluid like the white of an egg, and a thick matter, to which the red colour properly belongs, which is much heavier than the former, and is called the *coagulum*. The last may be divided again into two different parts—into the *cruor*, or that part of the blood which is intrinsically red and coagulable, and *lymph*, or *fibrine*, to which the coagulation of the blood must be ascribed. The fibrine in young animals is much whiter than in older and stronger ones. The blood of the latter contains much more nitrogen than that of the former. If the nourishment of animals is changed, we also find an alteration in the constituent parts of their blood. It is also changed by diseases. In animals that are hunted to death, or killed by lightning, the blood does not coagulate. The blood of birds is more highly coloured and warmer than that of viviparous animals, and coagulates more easily in the air. That of reptiles and fishes coagulates with difficulty. Aided by magnifying-glasses of a strong power, one may observe in examining the blood of the living animal, or in blood which is newly drawn, that it consists, especially the *cruor*, of little globular bubbles, the *globules* of the blood, as they are called, the diameter of which amounts to about the three-hundredth part of a line. In blood that has been drawn some time, although this time may be very short, they are not to be discovered. They are the effect of the life that pervades the blood. The more robust and healthy an animal is the more globules are perceived. They show, as it were, the transition from the formless liquid to the original form of the first organized matter. The blood is of the greatest importance to the life of an animal, and may be considered as the source of life. As long as the body is living, the blood is in perpetual motion. When it is taken out of the body, a remarkable change soon follows: it begins to coagulate, and then undergoes, first, an acetous, and after a few days a putrid fermentation. All the blood takes its origin from the chyle, and deposits by degrees the nourishing particles requisite to the preservation and growth of the body, by a multitude of vessels adapted thereto. This is done while it is driven from the heart into the remotest parts of the body, and from thence back. The circulation of the blood is, as it were, the principle and first condition of life. With it, except in cases of fainting, suffocation, &c., life ceases. The heart, the centre of the circulation of the blood, has a twofold motion, of contraction and dilatation, which constantly alternate. With the heart two kinds of vessels are connected—the arteries and the veins. (See **BLOOD-VESSELS**). The circulation of the blood proceeds with astonishing rapidity: did it flow at an equal rate in a straight line, it would run in the space of one minute through 149 feet. This swiftness, however, exists only in the larger vessels near the heart; the farther the blood recedes from the heart, the slower its motion becomes. In a grown-up person in good health we may reckon on the mass of blood at 24–30 lbs.

BLOOD, AVENGER OF, in Scripture, the nearest relation of any one that had died by manslaughter or murder, so called because it fell to him to punish the person who was guilty of the deed. In the poli-

tical law of Israel the practice of punishment by the nearest relative, which had always been prevalent, was allowed to continue, while rules were laid down to prevent the chief abuses connected with it. The distinction was sharply drawn between murder and manslaughter. For the former no ransom or satisfaction was permitted. In the case of the latter, however, there were six cities set apart out of the number which the Levites occupied, placed at suitable distances over the extent of the land, three on each side of the Jordan, with roads leading to them which were well kept up, and these were cities of refuge to which the manslayer might flee, and within which he might dwell in safety without fear of the avenger. But he was not permitted to return to his own place; in fact, he had no safety, if he left his place of refuge, until the death of the high-priest during whose term of office his misfortune had occurred. See **CITIES OF REFUGE**.

BLOOD, THOMAS (commonly called Colonel Blood), was a disbanded officer of Oliver Cromwell, and a man distinguished in various audacious enterprises. He made an attempt to steal the crown and regalia from the Tower, in which he almost succeeded! Being, however, taken, he confessed his purpose without showing the least fear of death. Charles II. from idle curiosity went to see him, and Blood persuaded the monarch to pardon him. Charles even bestowed an estate worth £500 a year upon him, whilst poor Edwards, the keeper of the jewel-office, who valiantly defended the crown, and was wounded, lived forgotten.

BLOODHOUND, a variety of the common dog, called *Canis agax* by Linnaeus, *chien courant* by Buffon, remarkable for the perfection of its sense of smell. Owing to this circumstance these hounds were formerly much employed in pursuing criminals escaped from justice, or in tracing out robbers or enemies, whose course was inevitably discovered when once the bloodhound was placed upon their trail. In the border country of Scotland they were formerly much employed for such uses, but at present the race has become almost forgotten. In the countries of South America the Spaniards employed fierce dogs to aid them in conquering the Indians, and in the Southern United States bloodhounds were employed to track runaway slaves. All the varieties of hound, however, have much sagacity, and most of the larger and stronger breeds have great acuteness of scent, and might without much difficulty be trained to act as bloodhounds.

BLOOD-VESSELS are the tubes or vessels in which the blood circulates. They are divided into two classes—arteries and veins—which have two points of union or connection—the first in the heart, from which they both originate, and the other in the minute vessels or net-work in which they terminate. The arteries arise from the heart and convey the blood to all parts of the body; the veins return it to the heart. The arteries distribute throughout the body a pure red blood, for the purposes of nourishment; while the veins return to the heart a dark-coloured blood, more or less loaded with impurities, and deprived of some of its valuable properties. But this is not returned again to the body in the same state. For the heart is wisely divided into two portions or sides, a right and left, one of which receives the impure blood from the veins and sends it to the lungs to be defecated and freshly supplied with oxygen or vital air, while the other receives the pure red blood from the lungs, and circulates it anew through the arteries. The arteries arise from the left ventricle of the heart by one large trunk nearly an inch in diameter. This is gradually subdivided into smaller ones, as it proceeds towards the limbs, till they terminate at last in

BLOOD—THE GENERAL DISTRIBUTION OF THE BLOOD-VESSELS

THE ARTERIES ARE SHOWN IN RED THE VEINS IN BLUE



H the heart, l left side, r right side. Arising from the heart is the main artery Aorta (A). The letter is put on the vessel at some distance from the heart near where it gives off the branches (in red) for the head and arms, and at the point where it arches backwards and downwards to pass through the chest and belly till at A it gives off branches for the legs. Running alongside of the arteries are represented in blue veins. At K = represented the position of the kidneys and their veins. L represents veins of the lung. J jugular vein. Ch outlines of the chest.

vessels so small as to be almost invisible, and in a fine net-work of cells extending through the whole body, in which the blood is poured out, and nutrition, or the increase of the body, takes place, and from which the residue is taken up by the small veins, to be returned to the heart. The arteries and veins are widely different in their structure as well as their uses. The former are composed of very strong, firm, elastic coats or membranes, which are four in number. The external covering and the internal lining of the arteries, although belonging to different classes of membranes, are both very thin and soft. The second coat is very thick, tough, and elastic, being that which chiefly gives their peculiar appearance to the arteries. The third is formed of fibres, apparently muscular, arranged in circular rings around the tube of the vessels. It is well known that the pulse of the heart is felt in the arteries alone, although in the bleeding of a vein we sometimes see the blood start as if in unison with the beating of the heart. The pulse is produced by the wave or stream of blood which is driven by the heart through the arteries, distending and slightly elevating them, after which they instantly contract from their elasticity, and thus force the blood into the smaller vessels. The pulse varies in its character with the general state of the health. (See PULSE.) When arteries are cut or wounded the firmness of their coats prevents their closing, and hence arises the fatal nature of wounds of large vessels, which will remain open till they are tied up, or till death is produced.

The veins commence in small capillary tubes in every part of the body, and by their gradual union form large trunks till they at last terminate in two (one ascending from the lower parts of the body, the other descending from the head and arms), which pour their contents into the heart. Their structure is much less firm than that of the arteries. They are very thin and soft, consisting of only two thin coats or membranes. The inner or lining membrane is frequently doubled into folds, forming valves, which nearly close the passage in the veins, and thus give very material support to the blood as it is moving up in them towards the heart. These valves are not found in the veins of the bowels, the lungs, or the head. The number of the veins is much greater than that of the arteries, an artery being often accompanied by two veins. They differ also in this, that while the arteries are deeply seated in the flesh, to guard them from injury, the veins are very frequently superficial, and covered only by the skin. The veins, it is well known, are the vessels commonly opened in blood-letting, although in cases which render it necessary a small artery is sometimes divided.

There are two portions of the venous system which do not correspond exactly with our general description; these are the veins of the bowels and of the lungs. The former circulate their blood through the liver before it returns to the heart, and the latter, the pulmonary veins, convey red blood from the lungs to the heart. (For an account of the circulation of the blood, see HEART.) It should also be mentioned that the large vein which brings back the blood from the lower part of the body, receives from the lymphatic and lacteal vessels the chyle from the bowels which supplies the waste of the blood and nourishes the body, and the serous and other watery fluids which are taken up by the absorbents in all parts of the body.

BLOOMER COSTUME. *THE*, a style of dress introduced about the year 1849 by Mrs. Bloomer of New York, who proposed thereby to effect a complete revolution in female dress, and add materially to the health and comfort of the fair sex. It consisted of a jacket with close sleeves, a skirt reaching

a little below the knee, and a pair of Turkish pantaloons secured by bands round the ankles. Though adopted rather extensively in America, it was unable to hold its ground against the united strength of prejudice and ridicule, and in Britain it scarcely made further way than furnishing a favourite subject of burlesque on the stage, and of ridicule in the pages of Punch. One or two 'strong-minded females,' who ventured to brave public opinion by donning the new costume, were persecuted by the mob. Various forms of 'rational dress' have recently been put forward.

BLOOMFIELD, ROBERT, an English poet, born at Honington in 1766, the son of a tailor, learned to read at the village school, and in 1781 was sent to learn the trade of a shoemaker with his brother in London. The visiting of several places of worship, of a debating society, of Covent Garden Theatre, and the reading of sundry books, called forth his faculties, and he became almost unconsciously a poet. Hearing him one day repeat a song which he had composed, his astonished brother prevailed on him to offer it to the London Magazine, and it was accepted. The piece was called the Milkmaid. A second, the Sailor's Return, likewise found a place in that journal. Thomson's Seasons, the Paradise Lost, and other works of this kind, now became the subjects of his constant study. In the country, where he resided for a short time in 1786, he first conceived the idea of his poem the Farmer's Boy, which is characterized by a spirit of rural simplicity and innocence. It was written under the most unfavourable circumstances by a journeyman shoemaker in a garret. It was first shown to Capel Lofft in 1798, who was so much pleased with it, that, in conjunction with his friend Hill, he had it printed in 1800. Bloomfield was patronized by the Duke of Grafton, who bestowed on him a small annuity, and made him an under-seller in the seal-office. This situation he was forced to resign on account of ill health. He then worked again at his trade as a shoemaker, and employed himself in constructing *Molian harps*. Engaging in the book trade he became a bankrupt, and in the latter part of his life was afflicted with violent headaches, and became nearly blind. He was gradually reduced to such a state of nervous irritability, that apprehensions were entertained of his becoming insane. These fears were terminated by his death, which took place in August, 1823.

BLOUNT, SIR HENRY, born at Tittenhanger, Hertfordshire, in 1602, studied at Oxford, became a lawyer, travelled through various parts of the S. of Europe and Egypt, and published an account of his travels, which, though not distinguished by accuracy, were interesting, and passed through at least eight editions. He was knighted by Charles I., and during the civil war took part with the royalists. He was present at the battle of Edgehill, and is said to have been intrusted with the young princes. After the king's death he came to London, and was employed by Cromwell and the Parliament in several important affairs. He died in 1682. His infidel tendencies became more fully developed in his son CHARLES (born 1654), who made himself known as a deistical writer, and is said to have had the assistance of his father in writing a work called *Anima Mundi*, or a Historical Account of the Opinions of the Ancients concerning the Human Soul after Death, &c. Charles Blount wrote various other works of the same nature, containing open or covert attacks on Christianity, and afterwards gave practical proof of the effect of his principles on his own mind by committing suicide, Aug. 1693.

BLOW, JOHN, a celebrated musical composer, born in 1648, became organist of Westminster Abbey at the age of twenty-one, in 1676 also organist of

the Chapel Royal, and obtained the degree of Doctor of Music. In 1680 he resigned his post as organist of Westminster Abbey to his pupil Purcell. In 1699 he was appointed composer to the Chapel Royal, and he died in 1708. He was a voluminous composer, but many of his works have never been printed. Among his sacred pieces are upwards of a hundred anthems, fourteen church services, and various other compositions. A number of his secular compositions for one, two, or three voices, with accompaniment were published under the name of Amphon Anglicus.

BLOWING-MACHINE, a machine employed at iron-works and other places for supplying large furnaces with a blast of air. It is necessary that the current of air should be propelled into the furnace with a certain rapidity and volume, and also with regularity; for which purpose many contrivances have been employed. In minor operations two pairs of bellows may be used, so that while the one is emptying the other may be filling. Or what is called the double-bellows may be used, consisting practically of two bellows joined together by one of their boards, so that there are three boards instead of two, and two chambers instead of one. The upper chamber, to which the exit-pipe is attached, is filled from the lower, which is itself filled by means of a lever in the same way as the single bellows. The upper chamber is thus always supplied with air, which is forced out through the exit pipe by a weight or spring. In some cases large cylinders are made use of, with pistons working in them, the air being thus pumped into a reservoir, from which it is directed into the furnace under a regulated pressure. Various modern blowers are constructed on the fan principle, a fan or some similar contrivance, working within a drum or cylinder, being driven with great rapidity so as to force a regular current of air in the required direction. Instead of driving a current of air into a furnace, a blowing-machine may be employed to cause an artificial draught, as in the case of mines. In the smelting of iron by the hot-air blast, the air is heated before entering the furnace. The effect of the air is thus greatly increased, and the hot-blast is justly regarded as the most important modern improvement in the art of smelting. See IRON.

BLOWPIPE is the name applied to an instrument by means of which the flame of a candle, a gas-jet, &c., is made to produce an intense heat, being then employed for a variety of useful purposes. Its most simple form is that of a tapering tube about 8 inches in length, and curved nearly at right angles within 2 inches of its smaller extremity. At its larger end it is nearly $\frac{1}{2}$ inch in diameter, and at the smaller only large enough to admit a common-sized pin. It is made of brass or iron. In using it the flame of the gas-jet or candle is turned aside from its vertical to a horizontal direction by a stream of air impelled upon it, either from the lungs or from a double bellows. The flame in its new direction assumes a conical shape, and consists of two parts, visible by their different colours, the outer being reddish-brown, and the inner blue. The heat at the apex of the inner cone is the most intense, and is equal to that produced in the best furnaces. It is employed by the jeweller and goldsmith in the operation of soldering, and by other artists who fabricate small objects in metal; by the glassblower in making thermometers, barometers, and other glass instruments; by the enameller, and indeed wherever it is required to subject a small body to a strong heat.

The blowpipe has undergone a variety of improvements in the hands of the chemist, to whose researches it has proved an excellent auxiliary. In

its common form, as described, it consists simply of a tapering tube, having the smaller end, from which the stream of air is transmitted to the flame, curved so that the jet shall be sent sideways to the operator. Wollaston's portable blowpipe is formed of three pieces fitted into one another when in use, but which may be taken down and made to slide within each other, and carried within the pencil-case of a common pocket-book. Most laboratory blowpipes have a hollow bulb or enlarged part at or near the end, the object of which is to condense the vapour of the breath, which often proves injurious in the common form of the instrument. To prevent corrosion from the action of the moisture, the bulb is made either of silver or sheet-tin, and it is capable of being opened in order that it may be more easily cleaned. A little practice is necessary to enable the operator to keep up a constant blast for any length of time, the current of air being propelled through the pipe by the muscular exertion of the cheeks, while respiration is carried on through the nose. But when the process has to be long continued, even the operator of experience will find this burdensome, and the current of air is, in that case, supplied by bellows. This is the kind of blowpipe commonly used by glassblowers. Another form of blowpipe is that called the *coq-pile*. It consists of a hollow globe of metal mounted on a stand. The globe contains weak spirit, which is made to boil by the action of a lamp below it, the flame of which is acted upon by the vapour issuing from a blowpipe led from the globe. In order to prevent the pressure of the vapour from becoming too great, there is furnished at the top a safety-valve. This form of the blowpipe is, however, found not to be very effective. The gas blowpipe, commonly called the oxyhydrogen blowpipe, is a very important and intensely powerful variety, whose structure is due to Mr. Newman of London. Sir Humphry Davy suggested the employment of other gases instead of common air, and Dr. Clarke of Cambridge adopted the suggestion. Dr. Clarke found that a mixture of two volumes of hydrogen and one of oxygen produced the greatest effect. These gases are contained in a bladder attached to the end of a pipe which leads into a vertical cylinder, in which is fitted a piston, working through a collar at the top. By the action of this piston the gas from the bladder is compressed into a copper chamber, and thence issues to the flame through an ordinary blowpipe nozzle. To guard against explosions, the gases are kept in separate holders, and by means of a special kind of burner are prevented from mixing until they are just going to be burned. There are various other species of blowpipe, and many uses to which they may be applied; but for ample information on the subject see Plattner on the Blowpipe.

BLUCHER, **GESHAU** **LEBERECHT** **VON**, Prince of Wahlstadt, field-marshal of Prussia, and knight of almost all the distinguished military orders of Europe, was born at Kottuck, Dec. 16, 1742. When he was fourteen years of age his father, who by marriage had become the owner of an estate in Mecklenburg, sent him on a visit to a relative in the island of Rugen. Here the sight of some Swedish huzzars excited in him the desire of becoming a soldier. His parents and relations in vain attempted to dissuade him from this step; but he took service in a Swedish regiment as a volunteer in the capacity of a cornet. His first campaign was against the Prussians, and he was taken prisoner by the same regiment of huzzars which he afterwards commanded with so much honour. The commander of this regiment, Colonel von Belling, induced him to enter into the Prussian service. An exchange was agreed upon

with the Swedes, and Blücher was made lieutenant in Belling's regiment. Discontented at the promotion of other officers over his head, he left the army, devoted himself to agriculture, and by industry and prudence acquired an estate. After the death of Frederick II. he became a major in his former regiment, which he commanded with distinction on the Rhine in 1793 and 1794. Osches, Luxemburg, Frankenstein, Oppenheim (Jan. 16, 1794), Kirtweiler, and Edlisheim in the Palatinate, bear witness to his achievements. After the battle of Kirtweiler, in 1794, which added greatly to his reputation, he was appointed major-general of the army of observation stationed on the Lower Rhine. In 1802, in the name of the King of Prussia, he took possession of Erfurt and Mühlhausen. Oct. 14, 1806, he fought at the battle of Auerstadt. He then with the greater part of the cavalry followed the retreat of the Prince of Hohenlohe to Pomerania. His squadron, moving on the left of the main army, became separated from it so far that a junction was possible only by means of forced marches both in the day-time and at night. The latter Blücher thought himself not authorized to venture upon, and the Prince of Hohenlohe was forced to surrender at Prenzlau. Blücher, cut off from Stettin by this accident, threw himself into Mecklenburg, where he joined at Dambeck the corps of the Duke of Weimar, commanded by Prince William of Brunswick-Oels. All the troops, however, were too much fatigued to undertake any enterprise. Having the Grand-duke of Berg on his left flank, the Prince of Ponte-corvo in his front, and Marshal Soult on his right, Blücher was obliged to take post behind the Trave in order to draw off the three great divisions of the French forces from the Oder as long as possible. With this view he entered into the territory of the free city of Lubeck. This city was soon stormed by the overwhelming power of the French. Although Blücher with some troops escaped out of the city, yet being deprived of all means of defending himself, or continuing his flight, he was obliged to surrender at Ratkau on the 6th of Nov. This, however, he would not do until permission had been granted him to add the following clause to the instrument, that 'the capitulation was offered to him by the Prince of Ponte-corvo, and that he accepted it only from want of ammunition, provisions, and forage.' Blücher was now a prisoner of war; but he was soon exchanged for the French general Victor, and immediately after his arrival at Königsberg placed at the head of a corps, and sent by water to Swedish Pomerania to share in the defence of Stralsund, and to assist the efforts of the Swedes. After the Peace of Tilsit he laboured in the department of war at Königsberg and Berlin. He then received the chief military command in Pomerania, but at the instigation of Napoleon was afterwards with several other distinguished men, dismissed from the service. In the campaign of 1812, when the Prussians assisted the French, he took no part; but no sooner did Prussia rise against her oppressors than Blücher, already seventy years old, engaged in the cause with all his former activity. He was appointed commander-in-chief of the Prussians and the Russian corps under General Winzingerode, which at a later period was separated from him. His heroism in the battle of Lützen (May 2, 1813) was rewarded by the Emperor Alexander with the order of St. George. The battles of Bautzen and Hanau, those on the Katzbach (see WAHLSTADT) and Leipzig, added to his glory. On the Katzbach Blücher defeated the army of Marshal Macdonald, and delivered all Silesia. His army now received the name of the *Silesian*. Napoleon himself endeavoured in vain to check the *old general of Auziers*, as he called

him. Oct. 3, Blücher crossed the Elbe at Wartenburg. This bold step compelled the great Bohemian army under Schwartzberg, and the northern army under the Crown-prince of Sweden, to act with more spirit. The great battle of Leipzig approached. Oct. 16, he gained a signal advantage over Marshal Marmont at Möckern, forcing his way as far as the suburbs of Leipzig. On the 18th, in connection with the Crown-prince of Sweden, he contributed greatly to the defeat of the enemy, and on the 19th his troops made the first assault upon Leipzig. His promptitude and peculiar manner of attacking had already, in the beginning of the campaign, procured him from the Russians the name of *Marshal Forward*. From that time it became his name of honour throughout the whole German territory. Jan. 1, 1814, with the Silesian army, which now consisted of two Prussian, two Russian, one Hessian, and one mixed corps, he crossed the Rhine at Kaub, took possession of Nancy on the 17th, gained, February 1, the battle of La Rothière, and pushed forward towards Paris. His detached corps were, however, checked by Napoleon; yet Blücher, though with a great loss, effected his retreat towards Chalons. He then crossed the Aisne at Soissons, joined the northern army, obtained, March 9, a victory over Napoleon at Laon, and, in connection with Schwartzberg, at the close of the month, pressed forward to Paris. The day of Montmartre crowned this campaign, and, March 31, Blücher entered the capital of France. His king, in remembrance of the victory which he had gained near Wahlstadt, made him Prince of Wahlstadt, with a suitable income. In England, whither he followed the allied monarchs, in June of the same year, he was received by the people with enthusiasm. The University of Oxford conferred on him the degree of Doctor of Laws. He afterwards lived on his estates in Silesia till 1816, when the chief command was again committed to him, and he led his army into the Netherlands. June 15, Napoleon threw himself upon him, and Blücher, on the 16th, was defeated at Ligny. In this engagement his horse was killed, and he was thrown under his body. After this unfortunate yet honourable day, the true greatness of the field-marshal and his army became apparent. In the battle of the 18th Blücher arrived at the most decisive moment upon the ground, and taking Napoleon in the rear and flank, assisted materially in completing the great victory of Belle Alliance, or Waterloo (which see). He refused the proffered armistice, and forced Paris to surrender; opposing with energy, on this second conquest of the capital, the system of forbearance practised on the former occasion. As he was already a knight of all the military orders of Europe, the King of Prussia, to reward his new services, created a new order expressly for him. After the Peace of Paris the prince retired to his estates. Aug. 26, 1819, the anniversary of the battle on the Katzbach, the hero received at Rostock, his native place, an honour which is seldom bestowed in Germany. The whole body of his countrymen, the inhabitants of Mecklenburg, united to erect a monument commemorating his glory, executed by Schadow in Berlin. Blücher died, after a short illness, at his estate of Kriblowitz, in Silesia, September 12, 1819, aged almost seventy-seven years. June 18, 1826, a statue of bronze was erected to him in Berlin, 12 feet in height, modelled by Rauch, and cast by Le Quine and Reisinger.—Blücher was not so eminent for military science as for ability in action. He himself often acknowledged this, when he was praising the merits of Gneisenau, to whose assistance he was greatly indebted. In battle, however, he had the eye of a falcon. His simplicity, good nature, and bravery endeared him to his sol-

diers, who loved him like a father. His addresses and proclamations are distinguished for their brevity, precision, and simplicity, forming a striking contrast to the high-sounding French proclamations of the time. See Blücher's Lebensbeschreibung (Blücher's Life), by Varnhagen von Ense, Berlin, 1827; and Scherr's Blücher, seine Zeit und sein Leben (Blücher's Life and Times; two vols., Leipzig, 1832).

BLUE, a well-known colour, and also the name of various dyes and pigments having this colour, and obtained from various sources. See COBALT, COLOUR, DYEING, INDIGO, SMALT, ULTRAMARINE, WOAD, PIGMENTS, and next article.

BLUE, PRUSSIAN, a colouring matter of a pure dark-blue colour, sometimes with a bronze lustre, sometimes dull; inodorous and insipid; insoluble in water, alcohol, or ether; decomposed by caustic alkalies. The discovery of this colour was accidentally made in 1704 by Diesbach, a manufacturer of colours, who, with the intention of precipitating the colouring matter from cochineal, with which alum and sulphate of iron were dissolved, procured some alkali from the laboratory of Dippel. This alkali, which Dippel had been heating with some animal matter, produced a beautiful blue precipitate. Dippel, discovering that the alkali had acquired this power of forming a blue precipitate of iron on account of its mixture with animal oil, soon learned to prepare it in a more simple way. It is now prepared from the yellow prussiate of potash (potassium ferrocyanide—see PRUSSIC ACID) and copperas with sulphuric acid.

BLUE-BELL, the popular name of the wild hyacinth (*Scilla nutans*), and also in Scotland of *Campanula rotundifolia*, a plant usually known in England as the Hare-bell. The first-named plant belongs to the order Liliaceæ, and is a well-known ornament of woods in spring. It is a bulbous plant, with long, narrow leaves, and racemes of bluish-purple bell-shaped flowers. In the mass it gives to the localities where it flourishes a most striking colour, especially when associated with a host of golden daffodils. See HARE-BELL.

BLUE-BIRD, or **BLUE-ROBIN** (*Sylvia sialis*, or *Sialia sialis*), an insectorial bird belonging to the Sylviadæ or Warblers, inhabiting North America, over a great part of which it is a bird of passage, making its first appearance as a harbinger of spring. The middle of March is the ordinary time of mating, when the male blue bird is observed to be extremely devoted to the female, and shows the ardour of his attachment by every attention in his power. The nest of the former year is then repaired, and the female begins to lay her eggs, usually five, sometimes six, of a pale-blue colour. Two or three broods are raised in a season. The principal food of this species is insects, especially large beetles; berries, persimmons, and the seeds of various plants, are also discovered in their stomachs. The spring and summer song of the blue-bird is a soft and often-repeated warble: in the month of October it changes to a single plaintive note. About the middle of November the blue-birds nearly all disappear. They are always regarded with favour by the farmer. The male blue-bird is 6½ inches long, with very full and broad wings. All the upper parts are of a rich sky-blue, with purple reflections; the throat, breast, and sides rich, ruddy chestnut; the bill and legs are black. The female is easily known by the duller cast of the plumage on the back, and by the red on the breast not descending so low as in the male, and being much fainter. The blue-bird inhabits the whole of the United States, also Mexico, Brazil, Guiana, and the Bahama Islands. Wilson states that 'nothing is more common in Pennsylvania than to see large flocks of these birds, in the spring and

fall, passing at considerable heights in the air, from the s. in the former, and from the n. in the latter season. I have seen in the month of October, about an hour after sunrise, ten or fifteen of them descend from a great height, and settle on the top of a tall, detached tree, appearing, from their silence and sedateness, to be strangers and fatigued. After a pause of a few minutes they began to dross and arrange their plumage, and continued so employed for ten or fifteen minutes more; then, on a few warning notes being given, perhaps by the leader of the party, the whole remounted to a vast height, steering in a direct line for the s.w.'

BLUE-BOOKS, the official reports, papers, and documents printed for the British government to be laid before the Houses of Parliament. They are so called simply from being stitched up in blue paper wrappers, and include bills presented to, and acts passed by, the houses; reports and papers moved for by members or granted by government; reports of committees; statistics of trade, &c.

BLUE-PILL, a preparation of mercury for medicinal use. It consists of two parts by weight of mercury triturated with three parts of conserve of roses till it loses its globular form. This is mixed with one part of liquorice-root powder, and thus 3 grains of the mixture contain 1 grain of mercury. It is used as a purgative, especially in the case of a sluggish liver, and either alone or in conjunction with other medicines. It is, however, not a safe medicine to employ except under medical advice.

BLUE-RIDGE, the most easterly ridge of the Alleghany or Appalachian Mountains, which extends from the river Hudson s.w. to Georgia, but first receives the name of Blue-Ridge when it enters Virginia (East), the western portion of which it traverses. Many of the streams of Virginia rise in this range. The most elevated summits are the peaks of Otter (4000 feet), in Virginia.

BLUE-STOCKING, a pedantic woman; a lady regarded as too fond of learning. The origin of this name in England is thus given by Boswell in his Life of Johnson: 'About this time (1780) it was much the fashion for several ladies to have evening assemblies, where the fair sex might participate in conversation with literary and ingenious men, animated with a desire to please. These societies were denominated *blue-stocking clubs*, the origin of which name was as follows.—One of the most eminent members of these societies was Mr. Stillingfleet, who always wore blue stockings. Such was the excellence of his conversation, that his absence was felt as a great loss, and it used to be said, "We can do nothing without the blue stockings"; and thus by degrees the title was established.'

BLUM, ROBERT, a noted character in connection with the cause of Liberalism in Germany, was born at Cologne in 1807, of humble parentage. He served for a short time in the army, and became subsequently connected with the Leipzig Theatre, of which he acted for some time as secretary and treasurer. About the year 1840 he began to come prominently forward as the champion of the Liberal cause, and acquired much renown as a popular orator. On the outbreak of the commotions of 1848 he manifested great enthusiasm, and became soon the rallying-point of democracy in Saxony, and the leading member of opposition in the National Assembly at Frankfurt, to which he was sent that year as member for Leipzig. The events of October at Vienna inspired him with fresh energy, and he proceeded thither at the head of a deputation to express the sympathy of the German democrats in the Frankfurt Assembly with the Viennese. He took an active part in the conflict of the citizens with the imperialists; but on the surrender of the capital

to Windischgrätz, was arrested with several of his companions on 4th November. Brought before a military tribunal, he pleaded in vain his privileges as a deputy from the German diet, and was condemned to be hanged, a sentence which was changed into death by the bullet. He was accordingly shot on the morning of 9th November, 1848.

BLUMENBACH, JOHANN FRIEDRICH, one of the most celebrated naturalists of modern times, born at Gotha in 1752, studied at Jena and Göttingen, and was appointed in the latter in 1776 extraordinary professor of medicine and inspector of the museum of natural history, and in 1778 ordinary professor. In 1788 he visited England, where he was received with marked distinction by George III. and his queen, and formed an intimacy with Sir Joseph Banks, Solander, and other distinguished naturalists, and in 1790 he repeated his visit. In 1812 he was appointed secretary to the Royal Society of Sciences at Göttingen, in 1816 became physician to the King of Great Britain and Hanover, in 1821 was made a knight-commander of the Guelphic Order, and in 1831 was elected a member of the Academy of Sciences at Paris. In 1825 the jubilee of his graduation as doctor was celebrated. On this occasion a medal was struck, and an endowment founded under the name of the Blumenbach Stipendium or Bursary, to assist young talented physicians and naturalists, and enable them to make scientific travels. In 1835 he retired from public life, and died January 22, 1840, at the advanced age of eighty-eight. The first work which brought him into notice was the thesis for his degree, entitled *De Generis Humani Varietate Nativa*, and from its publication in 1775 he continued almost for sixty years to exert a powerful influence on the progress of science, both by the number of distinguished pupils who were indebted for their first training to his admirable lectures, and by his valuable writings, partly inserted in the Transactions of scientific societies, and partly published as separate works. Among the latter, in addition to the thesis, which received important additions in subsequent editions, and may be said to have given a direction to the most important studies of his after life, are the *Institutiones Physiologicae*, first published in 1787, and long a text-book in many of the most celebrated schools of Europe; the *Handbuch der vergleichenden Anatomie* (Handbook of Comparative Anatomy), which, though now defective in consequence of the rapid progress which has since been made, was the best work that had appeared up to its date, and even still maintains its ground as a valuable manual; and his *Collectio Craniorum Diversarum Gentium*. The last work, contained in seven decades published between 1790 and 1828, gives descriptions and figures of his collection of skulls, one of the most extensive in existence, and still preserved at Göttingen, though not so carefully as its value deserves. In regard to the important subject of which it treats, Blumenbach held decidedly that the human race formed only one species, and had originally descended from a single pair; but he divided it into the five varieties of Caucasian, Mongolian, Negro, American, and Malay.

BOA, the name of a genus of reptiles belonging to Cuvier's tribe of *serpents* proper, having the tympanic bone or pedicle of the lower jaw movable, which is itself almost always suspended to another bone analogous to the mastoid, attached to the skull by muscles and ligaments, which contribute to its mobility. The branches of this jaw are not united, and those of the upper jaw are attached to the intermaxillary bone only by ligaments, so that these animals can dilate the mouth sufficiently to swallow bodies larger than themselves. Their palatal arches partake of this mobility. In the species of this tribe

not possessed of venom, the branches of the upper and lower jaw, throughout their entire length, as well as the palate bones, are armed with pointed, recurved, solid, and permanent teeth, forming four nearly equal rows above, and two below.

The genus *Boa* comprises all those serpents which, in addition to the preceding characters, have the *acuta* on the under part of the tail single; a hook on each side of the vent; the tail prehensile; the body compressed and largest in the middle, and with small scales, at least on the posterior part of the head.

The species properly belonging to this genus are among the largest of the serpent tribe, some of them, when full grown, being 30, and even 40 feet long. Though destitute of fangs and venom, nature has endowed them with a degree of muscular power which renders them terrible. Happily, they are not common in situations much frequented by mankind, but are chiefly found in the vast marshy regions of Guiana, and other hot parts of the American continent. Although sufficiently active when fasting or hungry, they become very sluggish and inert after having gorged their prey, at which time they are most easily destroyed. In order to obtain their food, the boss of largest size attach themselves to the trunk or branches of a tree, in a situation likely to be visited by quadrupeds for the sake of pasture or water. There the serpent swings about in the air, as if a branch or pendent of the tree, until some luckless animal approaches; then, suddenly relinquishing its position, swift as lightning he seizes the victim, and coils his body spirally round its throat and chest, until, after a few ineffectual cries and struggles, the animal is suffocated, and expires. In producing this effect, the serpent does not merely wreathe itself around its prey, but places fold over fold, as if desirous of adding as much weight as possible to the muscular effort these folds are then gradually tightened with enormous force, and speedily induce death. The animals thus destroyed by the larger boss are deer, dogs, and even bullocks. The prey is then prepared for being swallowed, which the creature accomplishes by pushing the limbs into the most convenient position, and then covering the surface with a glutinous saliva. The reptile commences the act of deglutition by taking the muzzle of the prey into its mouth, which is capable of vast extension; and, by a succession of wonderful muscular contractions, the rest of the body is gradually drawn in, with a steady and regular motion. As the mass advances in the gullet, the parts through which it has passed resume their former dimensions, though its immediate situation is always betrayed by external protuberance.

As already mentioned, the species of *Boa* are peculiar to the hot parts of South America, though nothing is more common than the error of confounding the great serpents of India, Africa, &c., with the proper *Boa*. The great serpents of the old continent belong to the genus *Python*, and will be treated of under that title. It is nevertheless true that Pliny has spoken of the huge serpents of India, and afterwards of large serpents of Italy, which were called *Boas*, the name being derived according to him from the fact of their sometimes sucking cows.

Among the most celebrated species is the *Boa constrictor*, distinguished by a large chain, formed alternately of large, blackish, irregular hexagonal spots, with pale, oval spots, notched at their two extremities, along the back. This is the largest species of the genus *Boa*, but several other large American serpents, whose habits are the same, are also called *boas*, though included in different genera. Among these are the ringed *boa*, which was worshipped in ancient times by the Mexicans and propitiated by human sacrifices, and the dog-headed *boa*. The *anaconda*

(which see) is also included by some in the genus *Boa*. The other species are of smaller size, and some do not much exceed that of the largest common snakes. We cannot reflect upon the natural history of these great reptiles without being struck with their peculiar adaptation to the situations in which they are commonly most abundant. In regions bordering on great rivers, which, like the Orinoco, &c., annually inundate vast tracts of country, these serpents live securely among the trees with which the soil is covered, and are capable of enduring very protracted hunger without much apparent suffering or diminution of vigour. Noxious as such districts are to human life, they teem with a gigantic and luxuriant vegetation, and are the favourite haunts of numerous animals, preyed upon, and to a certain degree restricted in their increase, by the boas. As their prey come within their reach, they require no deadly apparatus of poison to produce their destruction, since nature has endowed them with vast muscular strength. Once fairly involved in the crushing folds of a boa, the strength of the strongest man is of no avail. (See Plate at REPTILES.)

BOABDIL, *ABU-ABDULLAH*, last Moorish king of Granada, gained the throne in 1481 by expelling his father, *Mulei Hassan*; but being attacked by Ferdinand of Aragon, was defeated and taken prisoner. His father having resumed his crown, Ferdinand set him at liberty, and promised to assist him against his father, on condition of his agreement to become the vassal of Spain. He accepted the ignominious condition, and his father died of a broken heart. Boabdil was not permitted to reign in peace. By his tyranny he provoked the hostility of his own subjects, and Ferdinand, taking advantage of the dissensions which prevailed, laid siege to Granada. The Moors made a valiant defence, and were prepared to bury themselves under the ruins of the city, but Boabdil capitulated, and retired to a domain of the *Alpujarras* assigned him by the victor (1491). When on his way he turned round to take a last look of the city, and burst into tears. 'Tisright, my son,' exclaimed his mother Aixa, who was standing by him, 'weep like a woman for the throne which you had not the spirit to defend as a man and a king.' Boabdil soon afterwards passed into Africa, and fell in battle while assisting the King of Fez in an attempt to dethrone the King of Morocco.

BOADICEA, Queen of the Iceni, in Britain, during the reign of Nero. Having been treated in the most ignominious manner by the Romans, she headed a general insurrection of the Britons, attacked the Roman settlements, reduced London to ashes, and put to the sword all strangers to the number of 70,000. Suetonius, the Roman general, defeated her in a decisive battle, and Boadicea, rather than fall into the hands of her enemies, put an end to her own life by poison. This conflict took place A.D. 62.

BOARD, a number of persons having the management, direction, or superintendence of some public or private office or trust; often an office under the control of an executive government, the business of which is conducted by officers specially appointed.

BOARD OF ADMIRALTY, the officers appointed for the administration of the naval affairs of Britain. The chief of the board is called First Lord of the Admiralty. See ADMIRAL.

BOARD OF AGRICULTURE, a British government board, established in 1889, for the furtherance of the agricultural interests of the United Kingdom. It collects and publishes statistics of agriculture and forestry, issues regulations regarding pleuro-pneumonia and other cattle diseases; deals with the analysis of fertilizers and feeding stuffs, &c. It also publishes a quarterly journal.

BOARD OF TRADE, a department of the British government, having wide and important functions respecting the trade and navigation of the kingdom. It is a permanent committee of the privy-council, and is presided over by a member of the cabinet as president, there being also a permanent secretary, a parliamentary secretary, a comptroller-general of the commercial, labour, and statistical department, five departmental assistant secretaries, and a large staff of professional and other officials. The *Commercial, Labour, and Statistical Department* has to prepare the official volumes of statistics which are periodically issued. It may also be required to prepare special statistical returns for the information of members of parliament, chambers of commerce, or private persons who have occasion to apply. It gives information with regard to the state of the labour market at home and abroad, and publishes the *Board of Trade Journal*, a monthly periodical containing much matter of value to commercial men and others. The *Railway Department* has the supervision of railways and railway companies, and must be supplied with notices of application for railway acts and with plans, before the relative bill can be brought before parliament. Before a line is opened for traffic the permission of the board on the report of an inspector must be got; and on the occurrence of an accident notice must be sent to the department, which is then empowered to take any measures it may deem necessary for the public safety or interest. It also takes under its supervision tramways, subways, canals, gas and water works, and prepares provisional orders relating to such. The *Harbour Department* exercises a supervision over harbours, lighthouses, pilotage, &c. The *Marine Department* has to see to the registration, condition, and discipline of merchant ships, to watch over the mercantile marine offices, and to see that the regulations with regard to the engagement of seamen and apprentices are carried out; to examine officers, and make investigations into misconduct and wrecks; and generally to take in hand most of the business thrown upon the board by the various shipping acts. The *Financial Department* has to keep the accounts of the board, controlling the receipts and expenditure. It has also to deal with Greenwich pensions, seamen's savings-banks and money-orders, the proper distribution of the effects of seamen dying abroad, and the like. The *Fisheries Department* has to do with the regulation of both sea and inland fisheries. The *Bankruptcy Department* appoints official receivers, and generally carries out the provisions in regard to bankruptcy. The patent office is under the board of trade, as well as the standards of weights and measures.

BOAT, properly a vessel that may be propelled by oars, and is without a deck; but the term is used in a very wide and unrestricted way, and when we speak of a steam-boat we may mean a very large vessel. Boats differ in construction and name according to the services in which they are employed; according to the district or country to which they belong; according as they are intended for swiftness or burden, deep or shallow water, &c.—The *long-boat* or *launch*, is the largest boat belonging to a ship, and steam-launches are now common.—The *barge* is the next in size, but of slighter frame, and intended for carrying the commanding officers to and from the ship. The name is likewise given to a boat of state furnished and equipped in the most sumptuous style. The word is also applied to capacious boats of burden used on canals and rivers.—The *pinnaoe* resembles a barge, but is smaller.—The *cutter* of a ship are broader and deeper than the barge or pinnaoe, and are employed

in carrying light articles, passengers, &c., on board.—*Yaws* are used for similar purposes, and are smaller than cutters.—A *gig* is a long, narrow boat, used for expedition, and rowed with six or eight oars.—The *jolly-boat* is smaller than a yawl, and is used for going on shore.—A *wherry* is a light, sharp boat, used in a river or harbour for transporting passengers.—A *punt* is a flat-bottomed boat, chiefly used for one person to go on shore from small vessels.—A *skiff* is a small boat like a yawl, used for passing rivers.—A *Moses* is a flat-bottomed boat, used in the West Indies for carrying hogsheads from the shore to ships in the roads.—A *felucca* is a small vessel with six or eight oars, frequent in the Mediterranean; its helm may be applied in the head or stern as occasion requires. Also, a narrow-decked galley-built vessel in great use there, of one or two, sometimes even three, masts, and carrying lateen sails.—*Sono* is an American word, signifying a large, flat-bottomed, heavy boat, about 30 feet long and 12 wide. In some parts of the United States it is called a *gondola*. See CANOE, GALLEY, &c.

BOBBIN-NET. See LACE.

BOCCACCIO, GIOVANNI, whose name alone, as Mazzuchelli justly says, is equivalent to a thousand encomiums, was the son of a Florentine merchant. His family came originally from Certaldo, a village in Tuscany; whence he gives himself the appellation *da Certaldo*. He was the offspring of an illicit connection which his father formed while on a visit of business at Paris, and was born in that city, 1313. He early removed to Florence, where he began his studies, and even in childhood discovered a decided fondness for poetry. In his tenth year his father put him under the care of a merchant, to be educated in his business. With him he returned to Paris, and remained there six years without acquiring any fondness for his profession. His residence of eight years at Naples was equally ineffectual to this purpose. Instead of attending to trade, he formed the closest intimacy with several learned men of Florence and Naples, who had been drawn thither by that patron of the arts, King Robert. There is nothing to prove that he shared in the favour of the prince; but he enjoyed the particular affection of a natural daughter of his, for whom he composed many pieces in prose and verse, and to whom he often pays homage under the name of Fiammetta. Placed in fortunate circumstances, with a lively and cheerful disposition, of a soft and pleasing address, the favoured lover of a king's daughter, he regarded with more aversion than ever the station for which he had been intended. The fondness of the princess for poetry; his own intimacy with scientific and literary men; the tomb of Virgil, near Naples, which he used to visit in his walks; the presence of Petrarch, who was received with the highest distinction at the court of Naples, and who went from that city to Rome to be crowned with the poetic laurel; the intimacy which had arisen between the two poets—all operated powerfully on Boccaccio to strengthen and fix his natural inclination for poetry and literature. After living two years at Florence with his father he returned to Naples, where he was very graciously received by the Queen Joanna. It is thought that it was no less to gratify the young queen than his Fiammetta that he wrote his Decameron, which has raised him to the rank of the first Italian prose-writer. On the death of his father, becoming master of his own inclinations, he settled at Florence, where his first work was a description of the plague, which forms the opening of the Decameron. He afterwards wrote the life of Dante. He was chosen to inform Petrarch, at Padua, of his recall from exile, and the restoration of the property belonging to his father, who had died

during his absence. The friendship of these two men of genius continued for life. When Boccaccio, some years after, had exhausted his fortune in the purchase of costly books, and in expensive pleasures, he found in Petrarch the most generous assistance—the wise counsels of his friend were now as beneficial to his morals as they had been to his writings; in fact, to him he was indebted for the change which took place in his character. A dying Carthusian had persuaded him to renounce all the pleasures of the world; Petrarch softened his determination, and brought him back to that proper medium which marks the truly wise man. New troubles in Florence induced him to retire to Certaldo, where he owned a small estate. There he prosecuted his labours in tranquillity. He now composed several historical works in Latin. Among these is the first modern work which contains, in a collected form, the mythological notices which are scattered in the writings of the ancients. He was well versed in Greek, and had, at his own expense, brought Leontius Pilatus of Thessalonica from Venice to Florence, and maintained him three years at his house, in order to learn Greek of him, and to have his assistance in explaining the poems of Homer and translating them into Latin. He was the first who procured copies of the *Iliad* and *Odyssey* from Greece at his own expense, and spared neither cost nor trouble to obtain good Greek and Latin manuscripts. At the same time, he used all his influence to excite his contemporaries to learn the Greek language, and substitute the study of the ancients for that of the scholastic philosophy. The reputation which he had gained twice procured for him important missions to Pope Urban V. Having fulfilled these, he returned to Certaldo and resumed his studies. Here he was attacked by a severe and lingering disorder, which finally left him in a state of debility as painful as the disease itself. Upon his recovery he was charged with a difficult but very flattering trust. Dante had always been the object of his highest admiration. The Florentines, who had once persecuted and banished that illustrious poet, but now did justice to his merits, had resolved, by way of atonement to his memory, to establish a public professorship for the illustration of his poems, which were every day becoming more obscure as the distance of the time when they were written became greater. This new professorship was conferred upon Boccaccio, who devoted himself to it with so much ardour that his health could never be firmly re-established. This received a further shock from the death of his instructor and dearest friend Petrarch. He survived him not much more than a year, and died at Certaldo December 21, 1375. On his tomb was placed this inscription, composed by himself:

'Hæc sub mole jacent cineres sive ossa JOHANNIS,
Mens sedet ante Deum meritis ornata laborum
Mortalis vite. Gentor Boocarchius illi,
Patria Certaldum, studium fuit alma poemæ.'

Boccaccio appears, in all his works, to be a poet of the richest invention, the most lively imagination, and the tenderest and warmest feeling. In prose, he is a perfect master of composition. His Decameron, which contains a collection of a hundred tales, partly borrowed from the Provençal poets, is the work on which his fame chiefly rests. In this he painted, as it were, on one vast canvas, men of all ranks, characters, and ages, and incidents of every kind, the most extravagant and comical, as well as the most touching and tragic; and improved the Italian language to a degree of excellence never before attained. Of his other works we will mention only the following: *La Teseide*, the first attempt towards an Italian epic, and written in *ottava rima*, of which Boccaccio is con-

sidered the inventor; *Amorosa Visione*, a long poem in *terza rima* (the initial letters of which form two sonnets and a canzone, in praise of the Princess Maria, his mistress, whom he here ventures to address by her proper name); *Il Filostrato*, a romantic poem in *ottava rima*; *Ninfale Fiesolano*, in the same measure; *Ilme* (most of his sonnets, canzoni, and other amatory poems, he consigned to the flames, after reading the Italian poems of Petrarch; those which remain appear to have been preserved against his will); *Il Filocopo*, ovvero *Amorosa Fatica*, a hunting romance; *L'Amorosa Fiammetta*, a charming tale; *L'Urbano* (thought by some to be spurious); *L'Ameto ossia Ninfale d'Ameto*, a mixed composition, partly in prose, and partly in verse; *Il Corbaccio*, ossia *Laberinto d'Amore*, a pungent satire against a lady who had offended him; and, finally, *Origine, Vita e Costumi di Dante Alighieri*, a work interesting for the characteristic traits which it records; and his *Commento sopra la Commedia di Dante*, which, however, is carried no farther than the seventeenth canto of Dante's *Hell*. His Latin works are: *De Genealogia Deorum*, Libri xv.; *De Montium, Lacuum, Sylvarum, Fluviorum, Stagnorum et Marium Nominibus Liber*; *De Causis Virorum et Feminarum Illustrium*, Libri iv.; *De Claris Mulieribus*; and *Eloges*. There are many translations and innumerable editions of the *Decameron*, which would be more generally read were it of a less licentious character. The first English translation appeared in 1624. Boccaccio was a contemporary of Chaucer, who derived some of his materials from the Italian poet, and probably became personally acquainted with him when on a mission to Italy.—In the ducal library at Florence, among the manuscripts collected by the celebrated Magliabecchi, Professor Sebast. Ciampi discovered a memorandum-book of Boccaccio, containing a record of his studies and some curious circumstances relating to himself and a number of his distinguished contemporaries. It was published at Florence in 1827.

BOCCAGE, MARIE ANNE DU, maiden name **LE PAGE**, a celebrated French poetess, member of the Academies of Rome, Bologna, Padua, Lyons, and Rouen, was born in Rouen, 1710, died there, 1802. She was educated in Paris, in a nunnery, where she discovered a love of poetry. Her first published work, a poem on the mutual influence of the fine arts and sciences, appeared in 1746, and gained the prize from the Academy of Rouen. She next attempted an imitation of *Paradise Lost*, in six cantos; then of the *Death of Abel*; next, a tragedy, the *Amazons*; and a poem in ten cantos, called the *Columbiad*. Madame du Boccage was praised by her contemporaries with an extravagance for which only her sex and the charms of her person can account. *Forma Venus, arte Minerva*, was the motto of her admirers, among whom were Voltaire, Fontenelle, and Clairaut. There is a great deal of entertaining matter in the letters which she wrote on her travels in England and Holland. Many of her works have been translated into English, Spanish, German, and Italian.

BOCCANERA, SIMONE, the first doge of Genoa, was born of an illustrious noble family, but early took part with the democratic party, and gained great popularity by undertaking the defence of the people against the nobles. During a commotion caused by the severity with which Philip of Valois had punished a mutiny on board some Genoese galleys in the service of France, the people wished to appoint Boccanera their abbe, an office which appears to have been similar to that of the tribunes at Rome. Boccanera declined to accept, on the ground that his noble birth would not allow him to become

a plebeian magistrate. The excuse only made the people more determined to place him at their head; and as he would not be abbe, they by acclamation called him doge. The office thus introduced for the first time into Genoa, in 1359, was exercised by Boccanera till 1344, when the ascendancy of a faction opposed to him obliged him to abdicate and retire to Pisa. He afterwards regained the office in 1356, and had held it for seven years, when his enemies succeeded in destroying him by poison.

BOCCHERINI, LUIGI, a celebrated composer of instrumental music, was born on Jan. 14th, 1740, at Lucca, and received from his father and the abbe Vanucci, music-master of the archbishop, his first instruction in music and on the violoncello. He further improved himself in the art at Rome, and afterwards went, with Filippo Manfredi, his friend and countryman, to Spain, where he met with but indifferent patronage, and latterly suffered greatly from indigence. His death took place at Madrid on 28th May, 1805. Previous to 1797 the King of Prussia, Frederick William II., who was a great lover of the violoncello, and admired Boccherini's compositions, had paid him a pension, on condition of his sending him yearly some of his quartets and quintets. The compositions which Boccherini published himself consist of symphonies, sextets, quintets, quartets, trios, duets, and sonatas for the violin, violoncello, and piano-forte. He never composed anything for the theatre; and of church compositions we find but one, his *Stabat Mater*. The adagios of Boccherini excited the admiration of the connoisseurs and the despair of the composers of his time. He may be regarded as a sort of minor Haydn, and he was the first who wrote instrumental quartets, of which all the parts are *obligato*, and determined the true character of this species of music. His melodies are more highly esteemed in England, France, and Spain than in Germany.

BOCHETTA, a pass of the Apennines, leading from Lombardy to Genoa, and traversed by the road from Novl. In the Austrian War of Succession (1746 and 1747), and in the French wars towards the end of the eighteenth century, it was the scene of several important events.

BOCHART, SAMUEL, descended from an illustrious family, though only the son of a Protestant minister, was born at Rouen in 1599, and gave proof of precocious talent by composing at the age of fourteen a Greek poem in praise of his master, Thomas Dempster, who was so much pleased with it that he published it at the head of his work on *Roman Antiquities*. He afterwards studied philosophy and theology at Sedan, visited England and Leyden, and returning to France about 1628, became Protestant minister of Caen, a post which he held till his death. Shortly after, a Jesuit of the name of Veron, who had been specially trained to controversy, and had received a diploma entitling him to travel the country and debate the points of difference between the Protestant and R. Catholic churches, challenged Bochart to a discussion. It took place in 1629, in the castle of Caen, in presence of the Duke of Longueville, governor of Normandy, and a large assemblage of nobility and gentry, and had continued for eleven days, when Veron, without waiting to bring it to a close, judged it prudent to take his departure. The debate was published by Bochart under the title of *Actes de la Conférence tenue à Caen*. His next work, entitled *Geographia Sacra seu Phaleg at Chanaan*, added so much to his reputation that Christina, queen of Sweden, sent him a letter in her own hand, inviting him to Sweden. He accepted the invitation, and had for his travelling companion the celebrated Huetius, afterwards Bishop of Avranches, and author

of an excellent work on the Christian evidences, entitled *Demonstratio Evangelica*. On his return to Caen in 1653, he learned that an academy had been founded there in his absence. He immediately joined it, and was afterwards one of its most distinguished members. Bochart's next great work is entitled *Hierozoicon, or an Account of the Animals mentioned in Scripture*. It was published in 1661, and was scarcely completed when its distinguished author, while addressing the academicians of Caen, was struck with apoplexy and died almost instantaneously. His health had previously given way under grief for the loss of a daughter, his only child. Besides the works above mentioned, he wrote several others, among which is a Letter to Dr. Morley, written, it is said, at the request of King Charles II., and discussing three important questions—*De Presbyteratu et Episcopatu*; *De Provocatione a Judiciis Ecclesiasticis*; *De Jure et Potestate Regum*. Bochart's principal works are still standards on the subjects of which they treat.

BOCHNIA, a town of Austria, in Galicia, in the government of Lemberg, near the Raba, 25 miles S.W. of Cracow. It is tolerably well built, with several churches, a gymnasium, a grammar and other schools, and a board for the regulation of mines and saltworks. The salt mines here employ 600 persons, and yield 15,000 tons per annum. Pop. (1800), 10,049.

BOCKH, AUGUSTUS, one of the most learned scholars of the nineteenth century, was born at Karlsruhe, Nov. 24, 1785. In 1803 he entered the University of Halle, where he was induced by the influence of Wolf to devote himself to the study of philology. After spending three years here, and more than a year at Berlin, he returned in 1807 to his native state, and in the same year became extraordinary, and two years later ordinary professor in the University of Halle. He had already acquired such renown as a scholar, that in 1810 he was offered the chair of rhetoric and ancient literature in the newly-founded University of Berlin; and here he remained enjoying this and other important offices and dignities for the rest of his life. The works of Bockh have made an epoch in the history of philology and archaeology. In his studies of classical antiquities he set forth the principle that philology ought to be an historical method intended to reproduce the whole social and political life of any given people during a given period; and in accordance with this he divided the science into two parts: 1st, *Hermeneutics and Criticism*; 2d, the *Practical and Theoretical Life of the Ancients*. His views were vigorously attacked in various quarters, but the majority of German scholars gathered round him, and he himself carried his views into effect in a number of important works. The most remarkable of these are the following—1st, an edition of Pindar (two vols. Leipzig, 1811–22); 2d, *Die Staatshaushaltung der Athener* (The Public Economy of the Athenians, two vols. Berl. 1817), which has been translated into English; 3d, *Metrologische Untersuchungen über die Gewichte, Münzfuss und Maasse des Alterthums* (Metrological Investigations of the Weights, Coins, and Measures of Antiquity, Berl. 1838); and 4th, *Urkunden über das Seewesen des attischen Staats* (Documents concerning the Maritime Affairs of Attica, Berl. 1840). Besides these he was uninterruptedly engaged from 1815 to the end of his life in making a collection of Greek inscriptions, which he published with the title *Corpus Inscriptionum Græcarum*, and the first four volumes of which appeared at Berlin between 1824 and 1862. The first three volumes of a collection of his minor works, edited by Ascherson, appeared during the lifetime of the author (Leipzig, 1856–66). Bockh died at Berlin, 3d Aug. 1867.

BOOKING, a village in England, county Essex, situated on a gentle acclivity on the Blackwater, a little N. from Braintree, with which it forms a continuous town. The only buildings of any note are the parish church, the Roman Catholic and Independent chapels, and the union workhouse. There is a large school, a literary institute, a Franciscan convent, public gardens, &c. Booking was formerly celebrated for its baize manufacture; this has now, however, been superseded by the crape and silk trade, which is carried on to a great extent, the weaving of silks, satins, and velvets employing many hundred hands. Pop. (1891), 3526.

BODE, JOHN ELIAR, an astronomer, born at Hamburg, 1747. He gave the first public proof of his knowledge by a short work on the solar eclipse of August 5, 1766. The approbation which this received encouraged him to greater labours, and in 1768 appeared his *Introduction to the Knowledge of the Starry Heavens* (ninth edition, 1822). In 1772 the Berlin Academy chose him their astronomer, and ten years afterwards he was made a member of that institution. His best works are his *Astronomical Almanac* (commencing 1774)—a work indispensable to every astronomer—and his large *Celestial Atlas* (*Himmelsatlas*) in twenty sheets, in which the industrious editor has given a catalogue of 17,240 stars (12,000 more than in any former chart). In 1825 he was released, at his own wish, from his duties in the Academy of Science and the observatory in Berlin. His place was filled by Professor Encke. He died in 1826. His empirical law as to the distance of the planets is well known.

BODIN, JEAN, a political writer of the sixteenth century, was born in 1530 or 1529 at Angers; studied law at Toulouse; delivered lectures on jurisprudence there, and afterwards went to Paris and practised. Being unsuccessful in his profession, he turned his talents to literary labours; was invited by Henry III. to his court; and afterwards travelled with the king's brother, Francis, duke of Alençon and Anjou, to Flanders and England, where he had the gratification of hearing lectures in Cambridge on his work *De la République*, originally written in French, but afterwards translated by Bodin himself into Latin. He died, 1596, at Laon, of the plague.

BODLEIAN LIBRARY. See **LIBRARIES**.

BODLEY, SIR THOMAS, the founder of the Bodleian Library at Oxford. He was born at Exeter in 1544, and educated partly at Geneva, whither his parents, who were Protestants, had retired in the reign of Queen Mary. On the accession of Elizabeth they returned home, and he completed his studies at Magdalen College, Oxford. He afterwards became a fellow of Merton College, and read lectures on the Greek language and philosophy. He went to the Continent in 1576, and spent four years in travelling. He was afterwards employed in various embassies to Denmark, Germany, France, and Holland. In 1597 he returned home, and dedicated the remainder of his life to the re-establishment and augmentation of the public library at Oxford. This he accomplished, procuring books and manuscripts himself, both at home and abroad, at a great expense, and by his influence and persuasion inducing his friends and acquaintances to assist in his undertaking. Sir Robert Cotton, Sir Henry Savile, and Thomas Allen, the mathematician, were among the principal contributors on this occasion. The library was so much augmented that Sir Thomas Bodley, who was knighted at the accession of James I., was induced to erect an additional structure for the reception of the increasing quantity of valuable books and manuscripts. He died in London, 1612, and was interred in the chapel of Merton College, in the university. He bequeathed

nearly the whole of his property to the support and augmentation of the library, which has been so much enriched by subsequent benefactions that it is at present one of the most magnificent institutions of the kind in Europe. See *Reliquiæ Bodleianæ* (London, 1708).

BODMER, JOHN JACOB, a celebrated German poet and scholar, born at Greifensee, near Zürich, July 19, 1693. Although he produced nothing remarkable of his own in poetry, he helped to open the way for the new German literature in this department. He was the antagonist of Gottsched in Leipzig, who aspired to be the literary dictator of the day, and had embraced the French theory of taste, while Bodmer inclined to the English. He has the honour of having had Klopstock and Wieland among his scholars. Bodmer was for a long time professor of history in Switzerland. He was a copious and indefatigable writer, entertained many incorrect views, but was of service, as we have already said, to the German literature, which was then in a low and barbarous state. He died at Zürich, 1783.

BODMIN, a town, England, county Cornwall, and nearly in its centre, chiefly on the slope of a hill, 26 miles N.W. of Plymouth, consists of three principal streets, and is well and substantially built. The church, erected about the middle of the fifteenth century, and situated at the E. end of the town, is the largest and, in the interior, the handsomest in the county. Here are also several dissenting chapels, National and other schools, a literary institute, county lunatic asylum, county jail, and a dispensary. In 1839 the holding of the county sessions and assizes was transferred to Bodmin from Launceston. Pop. in 1881, 5061; in 1891, 5151; in 1901, 5353.

BODONI, GIAMBATTISTA, superintendent of the royal press at Parma, chief printer of his Catholic majesty, member of several academies of Italy, knight of several high orders, was born 1740 at Saluzzo in Piedmont, where his father owned a printing establishment. He began, while yet a boy, to employ himself in engraving on wood. His labours meeting with success, he went in 1763 to Rome, and was made compositor for the press of the Propaganda. By the advice of the superintendent he made himself acquainted with the oriental languages, in order to qualify himself for the kind of printing required in them. He thereby enabled himself to be of great service to this press by restoring and putting in place the types of several oriental alphabets which had fallen into disorder. The infant Don Ferdinand about 1766 had, with a view of diffusing knowledge, established a printing-house in Parma, after the model of those in Paris, Madrid, and Turin. Bodoni was placed at the head of this establishment, which he made the first of the kind in Europe, and gained the reputation of having far surpassed all the splendid and beautiful productions of his predecessors in the art. The beauty of his type, ink, and paper, as well as the whole management of the technical part of the work, leaves nothing for us to wish; but the intrinsic value of his editions is seldom equal to their outward splendour. His Homer is a truly admirable and magnificent work; indeed, his Greek letters are the most perfect imitations that have been attempted in modern times of Greek manuscript. His splendid editions of Greek, Latin, Italian, and French classics are highly prized. He died at Padua November 29, 1813.

BOECE, BOEIS, or BOYCE, HECROT, one of the earliest Scottish historians, was born at Dundee about 1465, and was descended from a family of landed proprietors. The family surname probably corresponds with the modern Boyce. Boece studied first at Dundee, and then at the University of Paris, where

he took the degree of B.D., and became professor of philosophy in the College of Montaigu. Here he became acquainted with Erasmus, who professed a high esteem for him. About 1500 Boece quitted Paris to assume the principality of the newly founded university of King's College, Aberdeen. He had associated with him as sub-principal William Hay, his fellow-student in France and Scotland, and his brother as professor of canon law. His revenue as principal was 40 marks. He was also made a canon of Aberdeen. The death of his patron in 1514 occasioned his first work—a history of the prelates of Mortlach (the original see) and Aberdeen, including the life of Bishop Elphinstone, which occupies about a third of the volume. It was published in Paris in 1522 under the title *Episcoporum Murthlacensium et Aberdonensium per Hectorem Boetium Vita*. It was reprinted by the Bannatyne and New Spalding Clubs. One of Boece's characteristics, the love of completeness, appears in this work. With very scanty materials he begins it from the earliest period, and carries it down to Gavin Dunbar, the living occupant of the see. Five years afterward appeared the work on which his fame chiefly rests, the *History of Scotland*. The first edition is without date, but a commendatory epistle bears date 1527. Its title is *Scotorum Historie a prima gentis origine, cum aliarum rerum et gentium illustrationibus non vulgari, &c.* It is written, like his previous work, in Latin. The quality in which Boece excels as a writer is one not altogether useless to an historian, but very liable to prove a snare to him, imagination. He not only made free use of the fabulous chronicles of Fordun, but filled them out with new details where they were insufficient for his purpose. He is even accused of having sometimes invented the authorities he cites. The faults which would condemn a modern historian must not be viewed with equal severity at the dawn of literature, and Boece was not without compensating merits. His style as a writer is elegant, and he undoubtedly contributed much to the advancement of learning in his native country. He is also distinguished by a patriotic zeal to magnify the achievements of his countrymen, and by an enlightened love of political liberty in advance of the age in which he lived. The first edition of the history contains seventeen books; another edition published in 1574, with additions by Ferreri, contains an eighteenth and part of a nineteenth. In 1527 Boece received an annual pension of 50 pounds (Scots), which was to be continued 'until the king should promote him to a benefice of 100 marks Scots of yearly value.' The pension was paid till 1534, when it is supposed he received the promotion—a very unsafe inference. The rectorship of Tyrie, which he held at his death, is, however, supposed to have been the promotion in question. His death is supposed to have occurred in 1536, when a successor was appointed to this benefice.

BOEHME, or BOEHM, JACOB, one of the most renowned mystics of modern times, born in 1575 at Altschdenberg, a village in Upper Lusatia, near Görlitz; died in 1624. Boehme being the son of poor peasants, remained to his tenth year without instruction, and employed in tending cattle. The beautiful and sublime objects of nature kindled his imagination, and inspired him with a profound piety. Raised by contemplation above his circumstances, and undisturbed by exterior influences, a strong sense of the spiritual, particularly of the mysterious, was awakened in him, and he saw in all the workings of nature upon his mind a revelation of God, and even imagined himself favoured by divine inspirations. The education which he received at school, though very imperfect, consisting only of writing, spelling,

and reading the Bible, supplied new food for the excited mind of the boy. He became afterwards a shoemaker; and this sedentary life seems to have strengthened his contemplative habits. In 1594 Boehme became a master shoemaker in Görlitz, married, and continued a shoemaker during his life. Boehme withdrew himself more and more from the world. If we take into view his retirement, his piety, his rich and lively imagination, his imperfect education, his philosophical desire for truth, together with his abundance of ideas, and his delusion in considering many of those ideas as immediate communications of the Deity, we have the sources of his doctrine and his works. His first work appeared in 1616, and was called *Aurora*. It contains his revelations on God, man, and nature. This gave rise to a prosecution against him; but he was acquitted, and called upon from all sides to continue writing. He did not, however, resume his pen until 1619. One of his most important works is *Description of the Three Principles of the Divine Being*. His works contain profound and lofty ideas, mingled with many absurd and confused notions. Abraham von Frankenberg (who died in 1652), his biographer and admirer, has also published and explained his writings. The first collection of them was made in Holland in 1676 by Henry Betke; a more complete one in 1682 by Gichtel (ten vols., Amsterdam), from whom the followers of Boehme, a religious sect highly valued for their silent, virtuous, and benevolent life, have received the name *Gichtelians*. Another edition appeared in Amsterdam in 1730 under the title *Theosophia Revelata*, two vols. 4to; the most complete in six vols. In England, also, Boehme's writings have found many admirers. William Law published an English translation of them, two vols. 4to. A sect, taking their name from Boehme, was likewise formed in England, and in 1697 Jane Leadle, an enthusiastic admirer of his, established a particular society for the explanation of his writings, under the name of the *Philadelphians*.

BOEHMERIA, a genus of dicotyledonous plants of the order *Urticaceæ*, closely resembling the common stinging nettle. The genus is called after Boehmer, the German naturalist. The *Boehmerias* grow chiefly in the intertropical regions; there are many varieties growing in various parts of India, China, Siam, &c. The fibres of many species are tenacious, and capable of being used for manufacturing purposes. *Boehmeria nivea* is the plant commonly used in China for the extraction of the fibre called China grass, from which a beautiful cloth is woven. The Chinese cultivate it with care. They call it *chou ma*. This plant, under the Malay name of *ramée*, is now cultivated to some extent in the United States, and its fibre is becoming an article of commerce. The fibres of other species are coming more into use as they become better known. They grow wild in many districts, and are capable of rendering important service to commerce and to the industry of the countries which produce them. They yield materials suitable for a great variety of purposes, resembling in extent the uses of flax and hemp. The East India Company had their attention directed to them early in the century, but till recently they had fallen into neglect. A patent for the preparation of the fibre was obtained in Britain in 1849. *Boehmeria puya*, a native of the upper districts of India, has long been extensively used there. The plant is herbaceous, and grows to a considerable height, sometimes from 6 to 8 feet. The leaves are dark-green above, and silver-white below. They are serrated, but do not sting.

BOEOTIA, a country of ancient Greece, bounded s. by Phocæ and the country of the Opuntian Loc-

rians; n. by the Euripus, or Strait of Eubœa; s. by Attica and Megaris; and w. by the Aloyonian Sea and Phocia. Its surface is estimated at 1119 square miles; but the boundaries were not always the same. In the s. it is mountainous and cold, and the air is pure and healthy, but the soil is less fertile than that of the other portion, which, however, is said to suffer from malaria. The mountainous part in the s. was called in earlier times *Asia*. Among the mountains of Boeotia are several remarkable in history and mythology—Helicon (now *Zayora*), the mountain of the Sphinx, the Teumessus, Libethrium, and Petrachus. Hypatus (modern name *Samata*) bounded the Theban plain on the e. A feature of the country was Lake Copaia, the district round which is a valley completely surrounded by hills, and connected with the Eubœan Sea by subterranean passages. The lake was fed by the Cephissus, the largest river in the country, and the water was liable to accumulate more rapidly than the natural drainage of the country could carry it off. Hence the early inhabitants suffered much from inundations, and at a period previous to historical annals subterranean channels were built to carry off the water, which indicate a very early civilization, being recognized from the ruins of them which still remain as among the greatest works of antiquity. These works made Boeotia one of the most fertile districts of Greece. Recently the lake has been drained at great expense and a large tract of land reclaimed. The chief occupation of the inhabitants was agriculture and the raising of cattle. Boeotia was first occupied by Pelasgian tribes. In the time of Herotus (son of Itonus, and grandson of Amphictyon, from whom it is said to have derived its name) these were subject to the Hellenes. It was divided into small states, until Cadmus the Phœnician founded the government of Thebes. In later times all Greece worshipped the Hercules of Thebes. After the death of Xanthus, king of Thebes, most of the cities of Boeotia formed a kind of republic, of which Thebes was the chief city. Epaminondas and Pelopidas raised Thebes for a time to the highest rank among Grecian states. In Boeotia are several celebrated ancient battlefields, viz. Platea (now the village *Kokla*), where Pausanias and Aristides established the liberty of Greece by their victory over the 300,000 Persians under Mardonius; Leuctra (now the village *Parapogia*), where Epaminondas checked the ambitious Spartans; Coronea, where the Spartan Agésilæus defeated the Thebans; and Chæronea (now *Capranu*), where Philip founded the Macedonian greatness on the ruins of Grecian liberty. Near Tanagra, the birthplace of Corinna, the best wine was produced; here, also, cocks were bred of remarkable size, beauty, and courage, with which the Grecian cities, passionately fond of cock-fighting, were supplied. Refinement and cultivation of mind never made such progress in Boeotia as in Attica. The Boeotians were vigorous, but slow and heavy. Several Thebans, however, were worthy disciples of Socrates, and Epaminondas distinguished himself as much in philosophy as by his military talents. The people were particularly fond of music, and excelled in it. They had also some great poets and artists. Hesoid, Pindar, the poetess Corinna, and Plutarch, were Boeotians.

BOERHAAVE, HERMANN, one of the most celebrated physicians of the eighteenth century, was born Dec. 13, 1668, at Woorhout, near Leyden; died 23d Sept. 1738. Boerhaave received from his father a liberal education. In 1682 he was sent to Leyden to study theology. Here he gave, at the age of twenty, the first public proof of his learning and eloquence. In 1678 he received a gold medal from the city for an academic oration, in which he attacked the doctrines

of Spinoza. In 1689 he received the degree of Doctor of Philosophy, and maintained an inaugural dissertation, *De Distinctione Mentis a Corpore*, in which he attacked Epicurus, Hobbes, and Spinoza (Leyden, 1690). He now commenced, at the age of twenty-two, the study of medicine. Drelincourt was his first and only teacher. From him he received only a little instruction; and by his own solitary study he learned a science on which he was afterwards to exert so important an influence. His first study was anatomy, which he pursued from books rather than from observation. He attended dissections, indeed, but his writings show a deficiency of practical knowledge. Still he exercised a salutary influence on the study of anatomy, as the use he made of mechanical illustrations induced anatomists to apply themselves to a more accurate study of the forms of the organs. After this preliminary study, Boerhaave read all the works, ancient and modern, on medicine, in the order of time, proceeding from his contemporaries to Hippocrates, with whose superior excellence and correct method he was forcibly struck. He also studied botany and chemistry, and although still preparing himself for the clerical profession, was made in 1693 Doctor of Medicine at Harderwyck. His dissertation was *De Utilitate Explorandorum Excrementorum in Aëria, ut Signorum*. After his return to Leyden, some doubts being raised as to his orthodoxy, he finally determined to follow the profession of medicine. In 1701 the University of Leyden chose him, on the death of Drelincourt, to deliver lectures on the theory of medicine; on which occasion he pronounced his dissertation *De Commendando Studio Hippocratico*. In this he eulogizes the method of Hippocrates, which was that of experimental philosophy, to which Bacon had recently recalled the scientific world, but to which Boerhaave himself did not always adhere. Boerhaave now began to develop those great and peculiar excellences which make him a pattern to all who undertake the office of instruction. Pupils crowded from all quarters to hear him. In 1703 he delivered another dissertation, *De Usu Ratiocinii Mechanici in Medicina* (Leyden, 1703). In this he began to deviate from the Hippocratic method, and to introduce the first principles of a defective system, to which his eminent talents gave afterwards exclusive currency. His method was eclectic, combining the speculations of opposing schools, and led him to attach too much importance to mechanical and chemical theories of vital actions. In 1709 the University of Leyden appointed him successor to Houtton, in the chair of medicine and botany. On this occasion he delivered a dissertation, *Quâ Requiratur Medicinæ faciliæ asseritur Simplicitas*, which deserves to be placed by the side of those in which he recommends the study of Hippocrates. The course of instruction to which Boerhaave was now devoted, induced him to publish two works, on which his fame still rests, viz., *Institutiones Medicinæ in Usus Annuæ Exercitationis Domesticæ; and Aphorismi de Cognoscendis et Curandis Morbis in Usuâ Doctrinæ Medicinæ*. In the former, which is a model of comprehensive erudition and clear method, he unfolds his system in its fullest extent; in the latter he undertakes the classification of diseases, and discourses separately on their causes, nature, and treatment. The professorship of botany, which he also filled, contributed no less to his reputation. He rendered essential services to botany by his two catalogues of plants in the garden of Leyden, the number of which he had very much increased. We are indebted to him for the description and delineation of several new plants, and the introduction of some new species. In 1714 he was made rector of the university, and at the close of his term of

office delivered an oration, *De Comparando certo in Physica*, one of his best pieces. At the end of this year he succeeded Bidloo in the chair of practical medicine, which he occupied for more than ten years. In this office he had the merit of introducing clinical instruction, that is, of lecturing to his students at the bedside of patients in hospital, for the first time in Europe. Busily occupied as he already was, the university conferred on him, at the death of Lemort, the professorship of chemistry, which science he had taught since 1708. His *Elements of Chemistry* is one of his finest productions, and notwithstanding the entire revolution which has taken place in this branch of science, is still highly valuable. His experiments are remarkable for their accuracy. The part which treats of organic bodies is exceedingly good for that period. So extensive a sphere of action gained for Boerhaave a fame that few learned men have enjoyed. People came from all parts of Europe to ask his advice. His property amounted at his death to 2,000,000 florins. Peter the Great visited him on his travels, and a Chinese mandarin wrote to him with the address, 'To Boerhaave, the celebrated physician in Europe.' In 1722 an attack of the gout, accompanied with a stroke of apoplexy, obliged him to remit his active pursuits. New returns of his disorder, in 1727 and 1729, compelled him to resign the professorships of chemistry and botany, which he had held for twenty years. In 1730 he was again appointed rector, and at the close of his term delivered a celebrated address, *De Honore Medici, Servitutis*, perhaps the best of all those essays in which he represents the physician as the servant of nature, whose activity he is to awaken and direct. In this he returned in some measure to the principles of Hippocrates, from which, indeed, he had never departed far in practice. Boerhaave was a man of piety as well as learning. He rose early and devoted an hour every morning to prayer and the study of Scripture. He used to say that the life of a patient, if trifled with or neglected, would one day be required at the hands of the physician. He died 23d September, 1738.

BOERS (Dutch, *boer*, a peasant or husbandman), the name commonly applied to the South African colonists of Dutch descent. The Cape Colony was founded by the Dutch in 1650. The Dutch were at this period the leading maritime power of Europe, and their African colonies assumed great importance. When Holland was reduced to the last extremity by the invasion of Louis XIV., serious thoughts were entertained of making the Cape Colony the final refuge of Dutch independence, but this *crisis* passed away with the advancing power of William. The colony subsequently fell into comparative neglect, and the colonists, left to their own resources, began to develop a character of their own. The troubles in which the parent state was involved by European wars now began also to affect them. The colony was taken possession of by the English in 1795, restored at the Peace of Amiens in 1802, taken again in 1806, and finally ceded to England in 1816. The last change was highly distasteful to the colonists. Naturally distrustful of a foreign government, they had formed from their experience of the country and its inhabitants a policy and habits of their own, into which the new-comers could not be expected at once to enter. The Boers, moreover, were strongly conservative, believing that they understood the situation better than anyone else, and they had acquired in their struggles with the natives a reckless daring, which, added to the coolness and caution of the Dutch character, was likely to make them formidable opponents to any government which provoked their hostility. The policy of the British govern-

nore was not always adapted to the circumstances, and the attempts of the British missionaries, encouraged by the colonial government, to convert and civilise the natives excited the jealousy of the Boers, who thought their own interests compromised by the encouragement given to the converts. The government on various occasions sided with the Caffres against the Boers, which, whatever the merits of the particular disputes, was not calculated to conciliate the latter. The emancipation of their slaves in 1833, and the cession to the Caffres in 1835 of a frontier district of neutral territory in the N. filled up the measure of provocation, and the Boers resolved to place themselves by emigration beyond the British rule. A first band set out by land in 1835 for Port Natal, but being ignorant of the passes of the country, went out of their way. Part of them settled in the district near the Zoutpansberg or Salt-pan Mountain, part proceeded to Algoa Bay, but did not succeed in forming a permanent settlement. Another band also proceeding to Natal was attacked by the Matebele Caffres, and obliged to fall back on the Modder River. After receiving reinforcements they again advanced, and settling in the Orange River district, formed a commonwealth under Peter Retief. This colony was in 1837 invited to join the British settlers who had in the meantime taken possession of Port Natal. Crossing the Quathlamba Mountains for this purpose, Retief and some of his principal followers were treacherously murdered in an interview with the chief of the Zulu Caffres. The remainder turned southwards, and formed the settlement of Pieter Maritzburg. Under the leadership of Pretorius they defeated the Zulus, but the colonial government denied their right to form an independent community in this district. In 1842 a British force was landed, and the Boers were compelled to retire from the coast and acknowledge the British sovereignty. Many of them recrossed the mountains, and settled in the Vaal district. Further disagreements with the colonial government, which had now possession of Natal, led to another emigration to the N. of the Klipp River. Here they struggled successfully with the Caffres till 1845, when the colonial government proclaimed the Buffalo River the northern boundary of Natal. The Boers openly resisted, but finding their strength unequal to the conflict, again emigrated to the Vaal country. In 1848 the colonial government likewise annexed by proclamation the Orange River settlement. The Boers, headed by Pretorius, took up arms, but being defeated retired beyond the Vaal, and with the previous settlers formed the Transvaal Republic. Those who remained continued their resistance to the British authority until, in 1851, on the outbreak of the Caffre war, the British relinquished the Orange River territory, and recognized the independence of the Orange State. See CAPE COLONY, TRANSVAAL, ORANGE RIVER COLONY SOUTH AFRICAN WAR.

The Boers in general are usually described as frugal, industrious, and hospitable, but very ignorant, and distrustful of foreigners, especially of the English. Their character has sometimes been painted in darker colours, but this need not be taken as applying equally to all. Dr. Livingstone has given a vivid account of the degradation of some of those who were settled among the Bechuannas, and of their cruelties to the natives.

BOETHIUS, ANICIUS MANLIUS SEVERINUS, a celebrated Roman statesman and philosopher, was born about 470 A.D., in Rome or Milan, of a rich, ancient, and respectable family; and was educated in Rome, in a manner well calculated to develop his extraordinary abilities. Theodoric, king of the Ostrogoths, then master of Italy, loaded him with marks

of favour and esteem, and raised him to the first offices in the empire. He exerted the best influence on the administration of this monarch, so that the dominion of the Goths promoted the welfare and happiness of the people who were subject to them. He was long the oracle of his sovereign and the idol of the people. The highest honours were thought inadequate to reward his virtues and services. But Theodoric, as he grew old, became irritable, jealous, and distrustful of those about him. The Goths now indulged in all sorts of oppression and extortion, while Boethius exerted himself in vain to restrain them. He had already made many enemies by his strict integrity and vigilant justice. These at last succeeded in prejudicing the king against him, and rendering him suspicious of Boethius. His opposition to their unjust measures was construed into a rebellious temper, and he was accused of a treasonable correspondence with the court of Constantinople. He was arrested, imprisoned, and executed A.D. 524 or 526. His occupations as a statesman did not prevent Boethius from devoting himself assiduously to the study of philosophy. He was himself a philosopher, and practised in his life the virtues which he taught. He enjoyed a felicity in domestic life, which was due to his own virtues and those of his family. Thus in him the philosopher and the man were not separated. The avocations in which he laboured for the public good were the practical part of his philosophy. He made many laborious translations of the Greek philosophers, particularly of Aristotle. These translations, and especially his commentaries on Aristotle, caused him to be regarded up till the fourteenth century as the highest authority in philosophy. His treatise, *De Musica*, also supplied for many centuries the place of Greek originals. He was long considered a Catholic saint, but there is no evidence that he was even a Christian. His fame now chiefly rests on his *Consolations of Philosophy*, written in prison, a work of elevated thought and diction. It is written partly in prose and partly in verse. The oldest edition of this work was published at Nürnberg in 1473. It was translated by King Alfred and Chaucer, and was highly prized during the middle ages.

BOETHIUS, HECTOR. See BORCE.

BETTCHER, JEAN FREDERICK (his name is also spelled BETTIGER), was born at Schleiz in 1681; died in 1719. A man of dissolute manners and dishonourable conduct, he is celebrated for his extraordinary adventures, and his fortunate discovery of the famous Dresden porcelain. Apprenticed to an apothecary in Berlin, he spent his time in the pursuit of alchemy, and fraudulently pretended to have made gold. This discovery, as it was believed to be, exposed him to the danger of a prosecution for sorcery, to avoid which he fled. Such was the credulity of the time, that the Prussian government was anxious for his return, and the Elector of Saxony, then King of Poland, supplied him with the means of prosecuting his inquiries, and was entertained by his promises for three years. By the advice of Count Tschirnhausen, the elector was induced to turn the real chemical knowledge and abilities of Bettcher to account in developing the resources of the country. This sensible advice was rewarded with the discovery of a red clay at Meissen, from which a beautiful porcelain could be made. Bettcher was intrusted with the direction of the manufacture, but was so little trustworthy that he had almost to be detained a prisoner to prevent his divulging the secrets of the process. He had actually entered into a negotiation with some Prussians to do so, and his death alone saved him from the punishment of his treachery.

BOG, marshy land, composed of a substance called peat, the product of the slow decay of a particular

class of plants under certain conditions of temperature and moisture. Bogs were formerly supposed to owe their origin to the destruction of forests, and in particular to the obstruction of drainage from fallen trees, causing lodgments of water, and favouring the growth of marsh plants. This theory can only be partially true. Fallen trees and also standing roots are frequently found in a state of great preservation in bogs, but the agency of felled trees in the production of bog has been completely disproved, 6 or 7 feet of bog being found under the roots of remaining trees, showing the previous formation of the bog. The process of bog formation is thus described:—When a shallow pool induces the formation of aquatic plants, they gradually creep in from the borders to the deeper centre. Mud accumulates round their roots and stalks, and a spongy semi-fluid mass is formed, well suited for the growth of moss, particularly Sphagnum, which now begins to luxuriate, continually absorbing water, and shooting out new plants above as the old decay beneath; these are consequently rotted, and compressed into a solid substance, gradually replacing the water by a mass of vegetable matter. A layer of clay, frequently found over gravel, assists the formation of bog by its power of retaining moisture. When the subsoil is very retentive, and the quantity of water has become excessive, the superincumbent peat has sometimes burst forth and floated over adjacent lands. This happened near Killarney in 1896, and caused the loss of nine lives. Quagmires are caused by the decay of the roots of plants underneath. The plants thus detached from the bottom, rise to the surface, and are kept floating in moisture. Elastic under light pressure, they yield suddenly to the weight of heavy bodies, their only strength consisting in the interlacing of their decayed fibres.

Bogs are generally divided into two classes—red bogs, or peat mosses, and black bogs, or mountain mosses. The former class are found in extensive plains frequently running through several counties. The Chatmoos in Lancashire, and the Allon in Ireland, are examples of this class. Their texture is light and full of filaments, and is formed by the decay of mosses and plants of different kinds. The colour becomes darker, and the density increases with the depth of the bog. The lower parts, being more entirely decayed, approach nearer to the nature of humus than the upper portion. They are also more carbonaceous, and consequently more valuable for fuel. The depth of the red mosses varies from 12 to 42 feet. The chief reasons of the unproductiveness of this class of bogs are the acids in which the plants composing them abound, and which are noxious to the higher orders of vegetation, and the circumstance that the decomposition of the plants takes place under water, where they are excluded from the action of the oxygen and nitrogen of the air, and consequently deprived of the power of evolving carbon and ammonia. Black bog is formed by a more rapid decomposition of plants. It is heavier and more homogeneous in quality. It is common in Ireland and Scotland, but is usually found in limited and detached portions. In Ireland these frequently rest on a calcareous subsoil, which is of great value for reclaiming them. The black bog is so frequently found at high elevations that its reclamation presents considerable difficulties, but when it is found in plains or gentle inclinations it may be reclaimed with comparative ease. The soil in mountainous districts, being shallow, is not suited for cereals, but if the mistake of sowing these is avoided, they may be made into good pasture land. The reclamation of the extensive red bogs found in various parts of the country, especially in Ireland, which has

more than a million and a half of acres of them, has long occupied attention; but the progress of improvement has been hindered by questions of land tenure, disposal of capital, and other difficulties external to the practicability of the desired reformation. Many extensive experiments have, however, been made with encouraging success, and while it is perhaps doubtful how far reclamation will repay the immediate improver, it appears from a national point of view to offer undoubted advantages.

In the reclamation of bog land three things require to be accomplished. The land must be thoroughly drained, and a permanent system of drainage established. The loose and spongy soil must be mixed with a sufficient quantity of mineral matter to give the requisite firmness to its texture, and to fertilize its superabundant humus. Proper manures must be provided to facilitate the extraction of nutriment from the new soil, and a rotation of crops suitable for bringing it into permanent condition adopted. The difficulties of reclamation lie chiefly in the first and second of these requirements.

When the bog land is flat there is often considerable difficulty in providing main drainage with sufficient inclination to carry off the redundant moisture. There is a still greater difficulty in working deep bogs, and in the formation of the minor drains, from the treacherous nature of the soil. Men, horses, and even ploughs have to be provided with patterns or flat boards to prevent them from sinking; the drains also, from the yielding nature of the soil, are apt to fill up. The bog is sometimes cut up at first into open sections, which are gradually filled over as permanent drains are established, or the minor drains are cut at regular intervals in the form of wedges, narrowing as they descend, and with a shoulder on which the surface turf is replaced. These coverings, however, frequently give way. Wedges of earth or compressed turf are sometimes inserted to keep the drains open. When the soil is stony a permanent drainage is sometimes provided by raising the stones and breaking them to form a bed of gravel to lay in the furrows.

The materials best adapted for reclaiming peat are calcareous earths, limestone gravel, shell marl, and shell sand. Caustic lime, although it neutralizes the acids of the soil, causes too rapid a decomposition of the vegetable matter. These materials are frequently found in the subsoil or in the neighbourhood, but the labour of raising them from the subsoil is often greater than that of bringing them from other, especially from adjacent quarters.

Paring and burning, or removing a portion of the peat for fuel, when the subsoil is good, are other modes of facilitating improvement. The limited demand for peat fuel prevents the latter system being carried on extensively. Thoroughly reclaimed bogs are not liable to revert to their former condition. For further particulars of reclamation see CHATMOOS.

BOGATZKY, KARL HEINRICH VON, a well-known Protestant theological writer, born at Tankowa, Silesia, 1690; died at Halle, 1774. His principal works are, *Tägliches Schatz-Kästlein der Kinder Gottes*, published in 1718, *Geistliche Gedichte*, in 1749. The former has been translated into English, and is well known by the title of *Bogatzy's Golden Treasury*.

BOGDANOWITCH, HIPPOLYT FIEDEROWITZ, the Russian Anacreon, was born in 1743 at Perewolotschna, in White Russia. His father was a physician. He was designed for an engineer, went for the purpose of studying engineering to Moscow in 1764, and entered an academy there; but the sight of a splendid play, and the reading of Lomonosow's poems, turned his inclination to poetry. He wished

to become an actor, but the manager of the theatre, Chersakow, dissuaded him from his purpose. By his advice he applied himself to the study of the fine arts, and to learning foreign languages. He gained patrons and friends, and in 1761 was made inspector in the University of Moscow, and afterwards translator in the department of foreign affairs. In 1762 he travelled with Count Beloselsky as secretary of legation to Dresden, where he devoted his whole attention to the study of the fine arts and of poetry till 1768. The beautiful pictures in the gallery of that place inspired him to write his *Psyche* (*Duschenka*), which appeared in 1776, and fixed his fame on a lasting foundation. After this he devoted himself to music and poetry, in solitary study at St. Petersburg, till Catharine called him from his retirement. He then wrote on different occasions several dramatic and historical pieces. In 1788 he was made president of the imperial archives. In 1795 he took leave of the court, and lived as a private man in Little Russia. Alexander recalled him to St. Petersburg, where he lived till 1803. He was as remarkable for modesty as for genius, and a man of childlike goodness and vivacity.

BOGDO-oola, or **HOLY MOUNT**, a remarkable hill in Russia, in the government of Astrakhan, near the Ak tuba, and 14 miles E. of Tchernoiarsk. It forms an isolated cone, nearly 600 feet high, in the middle of a vast steppe. It appears to rest on limestone, overlain by sandstone, which on the N.E. side rises perpendicularly like a wall, and is cut into deep clefts, frequented by innumerable birds. The sandstone is succeeded by alternate red and white layers of clay and sand, which have a very singular appearance. The summit is chiefly composed of masses of rock-salt. At the foot of the hill there is a salt lake called Bogdoin Dabassu.

BOGLIPOOR. See **BRAGULPUR**.

BOGNOR, a rising English watering-place on the coast of Sussex, 9½ miles S.E. of Chichester by railway. There is a pier 1000 feet long, constructed chiefly of iron, and also an esplanade. The place was brought into vogue towards the end of last century by Sir R. Hotham, who spent £60,000 on it. Pop. (1891), 4096; (1901), 6180.

BOGODOUKHOFF, or **BOHODOUKHOFF**, a town of Russia, capital of a district of the same name, in the government and 34 miles N.W. of the town of Kharkov, on the Merle. It has leather manufactures. Pop. 10,904.

BOGOMILI, or **BOGOMILES**, a religious sect, said to have been pretty widely spread in Thrace and Bulgaria as early as the tenth century. They were persecuted by the Byzantine emperor, Alexander Comnenos, and their leader, named Basil, was burned alive at Constantinople in 1118. The name of the sect is said to be composed of two Slavonic words, meaning friends of God. The Bogomili believed that God had two sons, Satanuel and Jesus, or Logos. The former rebelled, and created the material world, and also man. God gave a soul to man, but he was left under the control of Satanuel until the coming of the Logos. The law was given to Moses by Satanuel, and is not recognized by the Bogomili, who accept of the Old Testament only the Psalms and the Prophets. The Logos, or Christ, came down from heaven to deliver man from the power of Satanuel. This sect, which held many extravagancies of doctrine, continued to exist for several centuries. They practised severe asceticism, rejected the sacraments, or put new interpretations on them, and made frequent prayers both by day and night.

BOGORODITZK, a town of Russia, capital of a district of the same name, in the government and 32 miles S.E. of the town of Tula. It is a mean-looking

place, but has manufactures of leather, and a good trade. Pop. 8050.

BOGOS, a people of Abyssinia, occupying a district to the S. of the Anseba, to the E. of Habab and Mensa, and to the N. and W. of Barca. The land is intersected by the broad and beautiful valley of the Anseba, and comprises on the W. the elevated and hilly region as far as the sources of the Barca, and on the E. the slopes of the plateau of Mensa. The climate and vegetation are similar to those of Abyssinia. The rainy season lasts from March to September, when the Anseba overflows its banks and fertilizes the valley through which it flows. There is a great variety both in the flora and the fauna of the country. Large baobab trees, sycamores, and tamarinds overshadow the banks of the Anseba, which are rendered almost impassable by the number of Euphorbia and creeping plants. At the same time there are to be found rhinoceroses, elephants, wild boars, buffaloes, antelopes, lions, leopards, wild cats, jackals, wolves, &c., in great numbers. The pop., according to Münchinger, is only about 10,000, who are engaged in agriculture and the rearing of cattle, and carry on a trade with the neighbouring places in corn, butter, ivory, skins, buffalo-horns, and ostrich-feathers. Their language, which is akin to the Agow, is called by themselves Belén. Their countenance is Greek in its contour, their body light, powerful, and well formed; the colour of their skin dark olive brown; their lips are thin, the cheek-bones not prominent, and they have generally bushy whiskers. The patriarchal institutions of the Bogos are peculiar. The members of each union of families are pledged to apprehend any one of their number who is charged with the commission of a crime. The laws relating to dowries, inheritance, and murder are regularly codified. The religion is the Christian, but Mohammedanism, which is increasing, has a considerable number of adherents.

BOGOTÁ (formerly *Santa Fé de Bogotá*), a city of South America, capital of the Republic of Colombia and the department of Cundinamarca, and seat of an archbishopric. It is situated on an elevated plain, 8665 feet above the sea, at the foot of two hills, with a delightful though moist climate, resembling a perpetual autumn; the mean temperature being about 58° Fahr. Seen from a distance, it presents a very imposing appearance, rising in the form of an amphitheatre. The streets are narrow, but regular, crossing each other at right angles, and many of them having a stream of water flowing down the middle. They are badly paved, and indifferently lighted; and are often in a filthy state. The principal street terminates at one end in a square, where stands among other buildings the capitol, a massive edifice recently erected, containing apartments for the Senate and House of Representatives, and various governmental departments. There are several other squares besides, of inferior pretensions, though spacious, and all ornamented with fountains. Bogotá being subject to earthquakes, the houses are low, and strongly built; few of them exceeding two stories in height. They are mostly constructed of sun-dried brick, white-washed, and tiled, without chimneys, stoves only being used. Traffic is carried on in the streets by mules, no vehicles of any kind being employed. There is one line of tramway running from the chief square to a village about three miles distant. The religious structures of the city are disproportionately numerous. The chief is the cathedral, which is a large and lofty building, with a façade of yellow stone, and towers of brick and stucco. Some of the churches, though gorgeously adorned interiorly, display more splendour than taste. Bogotá contains a university, a national academy, a school of fine arts,

a public library of 70,000 volumes, a national museum, an observatory, a botanic garden, &c. The inhabitants, mostly of mixed blood, are described as a mild, polite, and cheerful people. The women are reputed handsome, with fair and clear complexions, and Spanish physiognomy. The trade of Bogotá is very considerable, but is greatly impeded by the want of good roads and railways. A railway to connect it with the Magdalena, which is navigable for steamers, has been partly made, and it is the starting-point of two other railways, one of them 40 miles long. The manufactures consist of soap, cloth, leather, &c., but cannot be said to be of any great importance. Bogotá was founded in 1588, and rapidly increased in size, importance, and population, and became the capital of the Spanish viceroyalty of New Granada. In 1811 it was the seat of the congress which proclaimed the republic on the 12th of November. Bogotá was taken by the Spanish party under Morillo in 1816, but relieved by Bolívar in August, 1819, and soon after became the capital of the United Republic of Colombia, till the partition of the latter into three states in 1831. Subsequently it has been the capital of New Granada and of Colombia. Pop. (including suburbs), 135,000.

BOGUE, DAVID, the originator of the London Missionary Society, was born at Hallydown, Berwickshire, on the 18th February, 1750; died at Brighton, 25th October, 1825. After the usual course of study at Edinburgh he was licensed as a preacher in connection with the Church of Scotland. In 1771 he removed to London, and was for some time employed as usher in an academy, and afterwards became minister of an Independent chapel at Gosport. In 1780 he became tutor to an establishment for directing the studies of young men destined for the ministry in the Independent communion. Though employed with the details of what most men would have felt as a full occupation of their time, he now began the formation of a grand missionary scheme, which afterwards resulted in the London Missionary Society. The influence which the establishment of this institution had on the public mind was great, and the springing up of the British and Foreign Bible Society and the Religious Tract Society, at short intervals, proves how much good was effected by the impetus it imparted. In the establishment of both of these he took an active part, contributing to the latter body the first of a series of publications which have been of great use. In the year 1796 Mr. Bogue was called upon to show whether he was sufficiently imbued with the spirit of the gospel to enable him to forsake home and the comforts of civilized society, to devote himself to its sacred cause. The call was made by Robert Haldane, of Arthrie, who sold his estate to furnish funds for the enterprise. Their design was, in conjunction with two divines, who had recently left the Established Church of Scotland and become Independent ministers, to preach the gospel to the natives of India, and to form a seminary for the instruction of fellow-labourers in the same field. The names of the two other ministers who intended to join in this enterprise were the Rev. Greville Ewing of Glasgow and the Rev. W. Innes of Edinburgh. But the design was frustrated by the jealousy of the East India Company, who refused their sanction to the undertaking, a fortunate circumstance in as far as the missionaries were concerned; for a massacre of Europeans took place at the spot where it was intended the mission should have been established, from which these Christian labourers could scarcely have hoped to escape. In 1815 Mr. Bogue received the Diploma of Doctor of Divinity from the senatus

academicus of Yale College, North America. His zeal for the cause of missions, to which he had consecrated his life, continued to the last: he may truly be said to have died in the cause. He annually made tours in different parts of the country in behalf of the missionary society; and it was on a journey of this kind, in which he had been requested to assist at a meeting of the Sussex Auxiliary Society, that he took ill at Brighton, and died after a short illness. The only works of any extent for which we are indebted to the pen of Dr. Bogue are, *An Essay on the Divine Authority of the New Testament*; *Discourses on the Millennium*; and a *History of Dissenters*, which he undertook in conjunction with his pupil and friend Dr. Bennet. The first of these has been translated into the French, Italian, German, and Spanish languages, and has been widely circulated on the continent of Europe.

BOGUSLAWSKI, PALM HENRY LOUIS VON, an eminent astronomer, born in 1789 at Magdeburg; died at Breslau in 1851. He was educated in the cathedral school of Magdeburg, and early displayed a particular turn for astronomical pursuits. In 1806 he served for a short time in the army. The comet of 1807 gave him the first opportunity of making special observations. In 1809, having been appointed bombardier in the Silesian Artillery Brigade, he passed his examination in Berlin with so much distinction that he was named *lieutenant*, and remained in attendance on the general military school in Berlin, where he took part in Bode's observations on the great comet. The campaigns of the war of independence procured him, through his connection with Bode, access to the best observatories and the acquaintance of the most distinguished astronomers. At the battle of Culin he was wounded, and taken prisoner at Pirna. Having soon obtained his liberty he joined his corps at Erfurt. His military career terminated at the battle of Waterloo, after which, in consequence of a supervening weakness in his eyesight, he became unfit for further active service. He afterwards turned his attention to agriculture, and in course of time his eyesight was completely restored. His love for astronomy had always remained, though he had wanted proper opportunity for cultivating it; but in 1829, on resuming his residence in Breslau, his studies again took that direction, and he became first conservator and then director of the observatory. By his discovery, in 1834, of the comet named after him, and his observations on Saturn's rings, and the comets of Biela, Encke, Halley, &c., he rendered important services. As no chair was connected with his position at the observatory, he at first merely delivered popular lectures. A regular professorship, however, was given him in 1836. As a writer he made himself known by the publication of the *Uranus* (vols. i.-iii., Glogau, 1848-48).

BOHEMIA, BOHMEN (anciently *Boheim*), a province with the title of kingdom in the Austro-Hungarian monarchy, bounded on the s.w. by Bavaria, on the n.w. by the Kingdom of Saxony, and on the n.e. by the Prussian province of Silesia, and on the s.e. by Moravia and the archduchy of Austria. It contains 20,051 square miles, and has 5,843,094 inhabitants, of whom above three-fifths are Czechs, nearly 90,000 Jews, and more than 2,000,000 are Germans. Bohemia is surrounded on all sides by mountains, possesses large forests and many small lakes or ponds. Its plains are remarkably fertile. The largest rivers are the Elbe and the Moldau. All sorts of grain, flax, hops (the best in Europe), and fruits are exported. Wine is not abundant, but in the neighbourhood of Melnik is of pretty good

quality. The raising of sheep, horses, swine, and poultry is carried on to a considerable extent. The mines yield silver, copper, lead, tin, garnets and other precious stones, iron, cobalt, arsenic, uranium, and tungsten, antimony, vitriol, alum, calamine, sulphur, plumbago, and coal in abundance. There are also numerous mineral springs, but little salt.

The industry of Bohemia, favoured by its central situation, has long rendered it one of the most important governments of the Austrian Empire. Spinning and weaving are extensively carried on in the northern and south-eastern districts; manufactures of lace, ribbons, metal and wood work, chemical products, and other branches of skilled industry are also largely developed. Pottery, porcelain, glassware, cutting of precious stones, give employment to many hands. The glass-ware of Bohemia alone, which is known all over Europe, employs 50,000 workers. Large quantities of beer (Pilsener) of the kind known as lager are exported. Prague, the capital, is the centre of the manufactures and of the commerce of the country. The largest towns are Prague, Pilsen, Reichenberg, Budweis, Teplitz, Aussig, and Eger. For internal intercourse there are excellent highways, extending to 10,000 miles, and several important lines of railway leading both s.e. to Vienna and n.w. towards Dresden. The Bohemians of all ranks are distinguished for public spirit. Among the public establishments for education are a German and a Czech university at Prague, two technical high-schools, four theological academies, many gymnasia, and over 6000 schools. The prevailing religion is the Roman Catholic; other sects, however, are tolerated. The language of the country is Bohemian, a dialect of the Slavonic: in some districts, and in most of the cities, German is spoken. See **BOHEMIAN LANGUAGE** and **BOHEMIAN LITERATURE**.

Bohemia received its name from a tribe of Gallic origin, the Boii, who were expelled by the Marcomans at the commencement of the Christian era; the latter were in turn obliged to give place to the Germans, and these to the Czechs, a Slavonic people who had established themselves in Bohemia by the middle of the fifth century. The country was at first divided into numerous principalities, which were temporarily united into a monarchy in 627 under Samo, but the work of this prince did not survive himself. Charlemagne attempted the conquest of Bohemia without permanent result, although he succeeded in rendering it tributary; and the Emperor Louis had his army nearly destroyed by the Bohemians in 849. Christianity was introduced into Bohemia in the reign of Borzwoj I. (894-902), a descendant of Przemysl, whose family held sway in Bohemia for about six centuries (722-1806). In 1092 Bohemia was finally recognized as a kingdom under Wratiaslav II. Up to 1280 the monarchy was elective and then became hereditary; the right of election, however, was suspended, not abrogated. The monarchs received investiture from the German emperor, held one of the great offices in the imperial court, and were recognized as among the seven electors of the empire. Separated from Germany, however, by a rampart of mountains, by origin, language, and national customs, the Bohemians kept aloof from the general politics of the empire, and their kings frequently received dispensations from attending the diet. The peasantry were in a state of villenage, but there was a numerous and powerful nobility, the diet assembled frequently, and the nobles came armed to defend their rights. The royal authority was limited by the coronation oath. Bohemia was frequently at war with Poland, the emperor, or some of the surrounding states; it was successively united and disunited with Hungary,

Silesia, Moravia, &c., according to the course of wars and alliances. Ottokar II. (1268-1278) had extended his conquests almost from the Adriatic to the Baltic, when he lost them and his life in contest with Rudolph, the founder of the too successful house of Hapsburg. His grandson Wenceslas III. was assassinated at Olmütz, and with him closed the dynasty of Przemysl. The house of Luxemburg succeeded in 1310, and governed Bohemia till 1437. Under Charles IV. (1346-1378), who also held the sceptre of the German Empire, Bohemia prospered, and advanced in civilization and science. Towards the close of this second dynasty civil wars were excited by the promulgation of the doctrines of Huss and the persecution of his followers. These wars were protracted by the genius of John Ziska, the leader of the Hussites, a man who, although latterly quite blind, has for military genius been compared to Hannibal. Ziska was rarely defeated, and his success inspired the utmost enthusiasm in his followers. He has been called the inventor of the modern art of fortification, and by his skill in this art he made Mount Tabor an impregnable fortress. After the death of Ziska the moderate party of the Hussites, who were called Calixtines, from their insisting on the retention of the sacramental cup for the laity, united with the Roman Catholics, and Sigismund was acknowledged king in 1433. The conditions of this compact being ill observed, George Podiebrad, a nobleman of the reformed party, was for them elected king in 1458. On his death in 1471 they chose Wladislas, son of Cassimir, king of Poland, who also obtained the crown of Hungary. His son Louis lost both crowns with his life in the battle of Mohacz against the Turks, and Ferdinand of Austria became in 1527 sovereign of both kingdoms. Bohemia then lost its separate existence, being declared hereditary in the house of Austria. Its subsequent history pertains to that of the Austrian Empire. It was desolated by the Thirty Years' war, and it suffered severely from religious persecutions, by which, indeed, the reformed faith was almost entirely suppressed in it. The Emperor Joseph II. gave some protection to the Protestants. In 1848, when Europe was convulsed with revolutionary movements, a momentary attempt was made to assert the ancient independence of Bohemia against the Austrian dominion; a conflict took place between the army and the people, Prague was bombarded, and the insurrection suppressed. Since then the most prominent feature in the history of Bohemia has been a constant struggle for ascendancy between the Slavonic Czechs and the Germans.

BOHEMIAN BRETHREN, the name of a Christian sect which arose in Bohemia about the middle of the fifteenth century from the remains of the stricter sort of Hussites. Dissatisfied with the advances towards Popery by which the Calixtines had made themselves the ruling party in Bohemia, they refused to receive the *compacts*, as they were called, that is, the articles of agreement between that party and the council at Basel (30th November, 1438), and began about 1457, under the direction of a clergyman, Michael Bradatz, to form themselves into separate parishes, to hold meetings of their own, and to distinguish themselves from the rest of the Hussites by the name of *Brothers*, or *Brothers' Union*. Amidst the hardships and oppressions which they suffered from the Calixtines and the Roman Catholics without making any resistance, their numbers increased so much, through their constancy in their belief and the purity of their morals, that in 1500 their parishes amounted to 200, most of which had chapels belonging to them. The peculiarities of their religious belief are seen in their confessions of faith, especially their opinions with

regard to the Lord's supper. They rejected the idea of transubstantiation, and admitted only a mystical spiritual presence of Christ in the eucharist. In other points they took the Scriptures as the ground of their doctrines throughout, and for this, but more especially for the constitution and discipline of their churches, received the approbation of the reformers of the sixteenth century. This constitution of theirs was framed according to what they believed to have been that of the oldest apostolic churches. They aimed at restoring the primitive purity of Christianity by the exclusion of the vicious from their communion, and by making three degrees of excommunication, as well as by the careful separation of the sexes, and the distribution of the members of their society into three classes—the beginners, the proficient, and the perfect. Their strict system of superintendence, extending even to the minute details of domestic life, did much towards promoting this object. To carry on their system they had a multitude of officers of different degrees; namely, ordaining bishops, seniors, and conseniors, presbyters or preachers, deacons, ediles, and acolytes, among whom the management of the ecclesiastical, moral, and civil affairs of the community was distributed. Their first bishop received his ordination from a Waldensian bishop, though their churches held no communion with the Waldenses in Bohemia. They were destined, however, to experience a like fate with that oppressed sect. When, in conformity with their principle of not performing military service, they refused to take up arms in the Smalkaldic war against the Protestants, Ferdinand took their churches from them, and in 1548, 1000 of their society retired into Poland and Prussia, where they first settled in Marienwerder. The agreement which they concluded at Soudonir, 14th April, 1570, with the Polish Lutherans and Calvinistic churches, and still more the Dissenters' Peace Act of the Polish Convention, 1572, obtained toleration for them in Poland, where they united more closely with the Calvinists under the persecutions of the Swedish Sigismund, and have continued in this connection to the present day.

Their brethren who remained in Moravia and Bohemia recovered a certain degree of liberty under Maximilian II., and had their chief residence at Fulneck in Moravia, whence they have been known as the *Moravian Brethren*. The issue of the Thirty Years' war, which terminated so unfortunately for the Protestants, occasioned the entire destruction of their churches, and their last bishop, Comenius, who had rendered important services in the education of youth, was compelled to flee. From this time they made frequent migrations, the most important of which took place in 1722, and occasioned the establishment of the new churches of the Brethren by Count Zinzendorf. Although the old Bohemian Brethren must be regarded as now extinct, this society will ever deserve remembrance, as a quiet guardian of Christian truth and piety, in times just emerging from the barbarity of the middle ages; as a promoter of pure morals, such as the reformers of the sixteenth century were unable to establish in their churches; and as the parent of the esteemed and widely extended association of the United Brethren, whose constitution has been modelled after theirs. See UNITED BRETHREN.

BOHEMIAN FOREST (*Bohemwald*), a mountain range or ridge of central Europe, extending from the Fichtelgebirge southward towards the confluence of the Ilz and the Danube, and separating Bavaria from Bohemia. The Bohemian Forest in ancient times formed a part of the Silva Hercynia, the highest peaks being the Arber (4340 feet high)

and Rachel. The great abundance of wood has occasioned the establishment of many glass-houses, forges, &c., in this region. The inhabitants have acquired, in their seclusion from the world, many characteristic virtues and vices.

BOHEMIAN LANGUAGE, the language of Bohemia, otherwise called Czech, one of the Slavonic group of the Aryan or Indo-European family of tongues, and accordingly allied to Polish, Russian, Servian, Bulgarian, &c. (See SLAVS or SLAVONIANS.) The Czech (Bohemian) language or dialect was the first of the Slavonic idioms which was cultivated scientifically. It is spoken in Bohemia, Moravia, with slight variations in Austrian Silesia, in Hungary, and in Slavonia. Three chief dialects of this language are recognized, namely the Bohemian or Czech proper, the Moravian of Moravia and Silesia, and the Slovak of Hungary. That the Czech has been widely spread as a dialect of the Slavonian is proved, as well by its antiquity and its degree of cultivation, as by the extent of the countries whose national language it now is.

The Bohemian alphabet consists of forty-two letters, expressing a great variety of sounds. The English sound of *ts* the Bohemian expresses with *c*, the English *y* with *g*, the *sh* with *ss* or *s*, the Italian *ce* or *ci* with *c* modified, the French *ge* and *gi* with *z*, the Italian *u* with *y*, the *gn* with *n*, the English *w* with *w*, particularly at the end of words. By a happy mixture of vowels and consonants, and by a combination of the latter favourable for the pronunciation, the language has much euphony, though many call it rough on account of the *r* (read *rah*); but the sound of entire words, not that of the single letters which compose them, determines the roughness or smoothness of their pronunciation. The terminations of the various declensions and conjugations are mostly vowels, or the smoother consonants. In general, the Bohemian has a natural melody like that of the Greek.

The Bohemian has a wonderful facility for forming new derivatives from native words or roots. Thus, from the single word *byti* (his) there are more than 110 derivatives; from *děje se*, signifying *it happens*, there are more than ninety-five, without reckoning the frequentative verbs, verbal substantives, and adjectives. By the simple prefixing of the letters *s*, *w*, *r*, *z*, the verb acquires a different modification of meaning, thus, *s-razyti*, *v-razyti*, *w-razyti*, convey the meanings *to beat down*, *to beat off*, *to beat in*.

If one compares the Bohemian radical words with the analogous words in other languages, he will be astonished at the number of inflections and derivations by which the language of the Czechs is distinguished. This language has formed, from native roots, all the technical terms of theology, jurisprudence, philosophy, &c., and with every new invention can be further developed. A great part of the facility with which it receives new forms and additions rests upon its manifold declensions, and its numerous tenses and verbal forms. In this respect the Bohemian and other Slavonic languages excel those of all other modern nations, and equal the Latin or Greek. The participles give them a great deal of pliability, as they unite in themselves the advantage of verbs and adjectives by denoting, as verbal adjectives, at once the quality of the thing and the determination of the time, saving thus the use of the relatives *which*, *who*, *as*, and the prepositions *after*, *since*, &c., by which periods become so dragging.

Another peculiarity is the great variety of diminutives, by which not only small, but agreeable and dear objects are designated. Bohemian can also express concisely the frequent naming of a thing; for instance

Frantiskowati se (s read as sh), to use frequently the name Francis; *maecchowati se*, to use frequently the name step-mother. It possesses also the patronymic nouns; for instance, *královce*, the king's son. It indicates concisely that an action is completed; as *dopisati*, to write to an end. It contains inceptive verbs; for example, *hrbatím*, I am becoming hunch-backed; and many others.

The Bohemian language, moreover, has much expressiveness and energy, as it is not weakened by a number of articles, auxiliary words, conjunctions, and words of transition, but is able to represent the objects of imagination, of passion, and all the higher emotions of the poet and orator, in a quick, vigorous, and lively manner; by its brevity, heaping together the most significant words, and arranging the connection of the parts of speech according to the degree of feeling to be expressed, so as to give the style spirit and energy, or gentleness and equability. The Bohemian (like various other tongues) designates many objects by the imitation of natural sounds. Thus the names of many animals are taken from their voices, as *kruta*, the turkey; *kachna*, the duck. Many plants are named from their effects, as *bochlan*, hemlock (from headache). The conciseness of the language is increased by the absence of auxiliaries in the greater part of the verbs. The preterites, in the third person singular and plural, express a meaning still further condensed, as the variation in the last syllable is made to designate the sex; for example, *psal*, *psala*, *psalo*, he, she, it, has written; *psali*, *psaly*, *psala*, they have written. In like manner the Bohemian saves many prepositions and much circumlocution of other kinds, by the use of the instrumental, agreeing with the Latin ablative; for instance, *seceým meeč hlávu mu st' al* (I read like te), with a blow of the sword he has cut off his head. This language is, therefore, very well fitted for the translation of the Latin classics. By the use of the past participle active the Bohemian can designate, as well as the Greek, who has really performed the action contained in the predicate of the accessory clause, which the Latin, with its ablative absolute or participle passive, must leave always undefined and dubious. The same kinds of actions performed with different implements are often expressed by peculiar words; for example, the verbs *zřít*, *stržati*, *krájeti*, *řezati*, denote to cut with the scissors, with the sickle, with the knife, and with the scythe. In the subtlety of grammatical structure the Bohemian is like the Greek, and has the advantage over the Latin and other languages. In speaking of two hands, two eyes, &c., the dual number is used; for example, *ruce*, *oci*, &c. The language is also capable of expressing the idea of duration, referring to an indefinite past time, like the Greek *aeorist*; for instance, *kupoval dum*, *ale nekupil ho*, he was engaged in buying the house, and did not buy it. The language affords several preterite tenses, which are distinguished with great subtlety, as *kupil*, he has bought once; *kupoval*, he had purchased for a long time; *kupovával*, he had purchased formerly several times; *kupovával se*, he seldom had purchased in former times; moreover, by adding the auxiliary verb *byl*, a time still longer passed may be expressed, though this is very seldom used; for instance, *byl kupovával*, he had purchased in times long past. Another advantage of the language consists in the various future tenses by which the Bohemian denotes not only the time but also the duration, and the more or less frequent repetition of the action; for instance, *kupým*, I shall purchase once; *budu kupovati*, I shall be purchasing for a long time; *budu kupovávali*, I shall purchase several times; and *budu kupovávali*, I shall be purchasing very often. Not less manifold

in signification, and equally subtle in the determination of time, are the participles and the participial constructions. The determination of the sex and the number by the final syllable of the participle gives the Czech language no small advantage over others. Small connective particles of speech the Bohemian has in common with the Greek. The Greek *alla*, *men*, *gar*, *de*, *te*, &c., agree with the Bohemian *ale*, *pak*, *vsak*, *li*, *z*, *t'*; only the three latter are always affixed to a word. Finally, the free, unrestrained arrangement of the words contributes much to perspicuity, as the Bohemian is less fettered than almost any other modern language to a particular order.

BOHEMIAN LITERATURE, the literature of the Bohemians or Czechs. (See preceding article.) It has been divided historically into five periods. The first extends from the mythological times to 1409. It affords no written documents of remote antiquity. We know, however, that the language at an early period was similar to the present from the names of the gods, dukes, rivers, cities, mountains which have been preserved, such as Perun, Przemysl, Ibrzawog, Wltawa, Bila, Praha, Tetin. The Slavonian apostle Method, and the philosopher Constantine, called *Cyril*, made the Slavonians in Moravia acquainted with Christianity. From thence it penetrated to Bohemia, and thus the people of this country received the Graeco-Slavonic ritual in the year 845. The same Constantine invented for the sounds of the Slavonic language the Cyrillio-Slavonic alphabet, borrowed mostly from the Greek. In later times the Glagolitic alphabet sprang up, of which, however, less use was made. When the Latin church supplanted the Greek in Moravia and Bohemia, the Latin alphabet came also into use instead of the Cyrillic. In Bohemia the Cyrillic character remained in use only with the monks of Sazawa, who observed the Slavonic ritual. As the Latins endeavoured to annihilate all the writings of the old ritual, and the Slavonic language was, in many cases, obliged to give way to the Latin, Bohemian literature suffered incalculable injury; hence we possess from the earlier centuries but a few insignificant remains in the characters above-mentioned. In the tenth century the Bohemians had a school at Kudeř, in which they learned Latin. Their most ancient relic is the hymn (Hospodine Pomilujny) of Bishop Adalbert (Wegteck), a native Bohemian, which is sung to the present day even by the Russians and Poles. The Bohemians possess some remains of a collection of lyric-epic national songs, without rhyme, which seem to have been of great merit. The manuscript appears to have been written in 1290 and 1310. Goethe found these national songs worthy of particular attention. Under the Emperor Charles IV., who promoted the cultivation of the Bohemian language, the University of Prague was founded in 1348. In the Golden Bull he commanded the sons of the German electors to learn the Bohemian language. Under his son, the Emperor Wenceslas, all decrees were written in Bohemian, which formerly were in Latin. Prague was then not only the most populous city in this part of Europe, but also, on account of its splendid court and the wealth of its citizens, the centre of the arts and sciences. Almost all the intellectual currents of the West found entrance into Bohemia, and German literature in particular had a powerful influence. The heroes of the Alexandrian and Arthurian cycles of romance became familiar to the Czechs in their own language. Dalimil Mezirik wrote a history of Bohemia in verse; Ondřej Z. Dube, a collection of Bohemian laws, in three vols.; Warneč Z. Brezowa, a history of the Roman emperors, and translated Mandeville's Travels; and Pribik Pulkawa, a Bohemian history.

This period affords also many vocabularies, poems, songs, and translations.

With Huss commenced the second period, from 1409 to 1500, which elevated the character of the Bohemian language and nation. The prevalence of religious disputes caused the Bible to be generally read and understood. Huss of Husinetz translated Wicliffe's book *Trilogus* into the Bohemian tongue, and sent it to the laymen as presents. The *Treatise of the Six Errors* he caused to be inscribed in Bohemian on the walls of the chapel of Bethlehem. He wrote his first collection of sermons when at the castle of Kozý (1413), besides an Appeal to the Pope, a Commentary on the Ten Commandments, an Explanation of the Twelve Articles, two sermons on the Antichrist, the Triple Cord, and several excellent hymns. His letters from the dungeon in Constance to the Bohemians were translated by Luther into Latin, accompanied with a preface, and printed at Wittenberg in 1536. He and Jakobellus and Jerome improved and distributed the Bohemian Bible, of which several copies have been preserved to our times. Of Zizka of Trocnow, one of the greatest generals in history, several letters and his rules of war have been preserved. From this period there have come down to us, also, several war-songs of the Taborites, also some songs of Prague. Martin Lupac undertook, with the assistance of some learned men, the labour of retranslating the whole New Testament. The church-service was now performed entirely in the Bohemian language. Many controversial writers of this period might be mentioned. Mladienowic, an eye-witness of the execution of Huss, wrote an account of his life. This used to be read in the Bohemian churches. Procopius continued the rhyming chronicles of Dalimil. Lodkowic related his journey to the Holy Sepulchre. Sasek of Meyzhor wrote *Notes and Travels* through Germany, England, France, Spain, Portugal, and Italy of the Bohemian Baron Loew of Rozmital and Vlatna (whom he accompanied), a contribution to our knowledge of the manners of the fifteenth century, which was published by Jos. Edm. Horky, in a German translation printed at Brunn, 1824. M. Gallus, Albij, Chrislan, Zidek, J. Cerny, J. Blowic, and Sundel, wrote on medicine, astrology, and agriculture. As early as 1447 we have an anonymous work on the grafting of trees. We have also the rhyming legend of the 10,000 knights, a translation of the fables of *Æsop*, the council of the beasts and birds, in prose and verse, in three vols (*Placj Rada*). Each lesson, which flows in rhyme from the mouths of the animals, is preceded by the natural history of the animals and the moral. It was printed three times in the Bohemian language, and published at Cracow in Latin verse, 1521, 4to. Of the Bible fourteen translations have come down to us, besides ten of the New Testament. The oldest, of the year 1400, is in Dresden. The typographic art made a rapid progress in Bohemia. The first printed work was the Epistle of Huss from Constance, in 1459; the second, *The Trojan War*, in 1468; the third, a New Testament, in 1474; the whole Bible, in 1488; the first almanac, in 1489.

The third age, from 1600 to 1620, may be called the golden age of the Bohemian language. During those dreadful tumults in which, not only in this kingdom, but also in the neighbouring countries, populous cities became heaps of ashes, and innumerable villages entirely disappeared, the peculiar tendency of the people to investigation, and their predilection for science and art, developed themselves. The cultivation of learning—in other countries, with only a few exceptions, the monopoly of the clergy—was in this favoured land open to the whole nation. All

branches of science were elaborated, and brought to an uncommonly high degree of improvement for that time. The purpose of this work does not allow us to enumerate all the authors of this age, since under Rodolph II. alone there were more than 150. Gregory Hruby of Geleni translated the work of Petrarch *De Remediis utriusque Fortunæ*. W. Piesocky translated from the Greek the *Exhortation of Isocrates to Demonikos*. John Amos Comenius wrote fifty-four works, some of which were very excellent. He published his *Janus* and an *Orbis Pictus*, which were translated in his lifetime into eleven languages, have passed through innumerable editions, and are not yet surpassed. In all the *x.* of Europe Comenius attracted attention by his projects for improving education, which were deliberated upon even by the diet of Sweden and the Parliament of England. The hymns of this and the earlier ages, part of which have been translated by Luther, may serve as standards for all languages. In Prague alone there were at this period eighteen printing-presses, in the country towns of Bohemia seven, and in Moravia also seven: many Bohemian books, too, were printed in foreign countries, as in Venice, Nürnberg, Holland, Poland, Dresden, Wittenberg, and Leipzig.

The fourth period begins with 1620 and ends with 1774. After the battle at the White Mountain, the whole Bohemian nation submitted entirely to the conqueror. The population of most of the cities and of whole districts migrated in order not to be false to their faith. More than 70,000 men, and almost the whole of the nobility, all the Protestant clergy, scholars, and artists, in general the most cultivated part of the nation, left their native country. Of these emigrants the greater part formed the flower of the army of Count Mansfeld. Hence the Thirty Years' war depopulated Bohemia more than any other country, since these fugitives endeavoured to regain their native country by repeated invasions. Nothing, however, was so disadvantageous to Bohemian literature as the introduction of monks, who were mostly Italians, Spaniards, and Southern Germans, who condemned every Bohemian work, as heretical, to the flames, so that individuals boasted of having burned about 60,000 manuscripts, which they took from the people by force, after searching their houses. Such works as escaped the flames were shut up in monasteries, in carefully-secured rooms, fastened with iron grates, doors, locks, bolts, and chains, and often inscribed with the warning title *Hell*. Instead of these excellent remains of the classical times of the country they gave the Bohemians nonsense of all kinds; accounts of hell and purgatory, the reading of which made many of the populace maniacs; though even this stuff was in many cases burned and mostly forbidden. The fugitives established at Amsterdam, Dresden, Berlin, Breslau, and Halle printing-presses, and sent to their brethren in Bohemia, Moravia, and Hungary a number of books, mostly new editions. Some Bohemians who observed the decay of their language strove to remedy it; as Pesina Z. Cechorodu; Joh. Beckowsky, who continued the Bohemian history to 1620; W. Weseley, who wrote a work on geometry and trigonometry, &c.; but the decay was too great to admit of being checked; the nobility had become strangers, and the government encouraged only German literature. From this time, therefore, the Bohemians wrote more in the German language.

In the fifth period, from 1774 to the present time, a new ray of hope shone on Bohemian literature, when, under the Emperor Joseph II., a deputation of secret Bohemian Protestants, trusting to his liberal views, made him acquainted with the great number of their brethren of the same faith. He perceived

the necessity of introducing toleration, and hundreds of thousands of Protestants in Bohemia and Moravia came to light: their concealed works were printed anew, their classical language was again acknowledged and cultivated. Under this protection many men of merit, mindful of the fame of their ancestors, endeavoured to cultivate anew all branches of the sciences, and to rival, if possible, the results attained by their more advanced neighbours. From about the year 1820 great activity was manifested by the Bohemian writers in the various departments of literature. A little before this Milton's *Paradise Lost* was translated into Bohemian, and subsequently Shakspeare's dramas, or most of them, were likewise translated, the native drama being also cultivated. Kollar and Chelakovsky distinguished themselves in poetry, and perhaps even more Hynek Macha, whose poem *May* is said to still maintain an influence over Bohemian poetry. Kollar and Chelakovsky were advocates of the Panславic movement. The chief work of the former was *Slava's Daughter*, a long lyric-epic poem. Several writers became well known as novelists, some of them following the lead of Sir Walter Scott. Jungmann (the translator of Milton) brought out a valuable *History of Czech Literature*, and Schafarik his *History of the Slavonic Language and Literature and his Slavonic Antiquities*. Among more recent poets of note may be mentioned the names of Halek Heyduk and Neruda, but it must be admitted that few Bohemian writers have become generally known, even by name, to the European reading public.

BOHEMOND, MARC, son of the Norman adventurer Robert Guiscard, who rose to be Duke of Apulia and Calabria, was born about 1056; died 1111. He became familiar with warfare when a mere boy, and having been early intrusted by his father with military command, gave proof of a rare combination of prudence and valour. He took a prominent part in various expeditions to Greece and Illyria against Alexis Comnenus, and repeatedly defeated his troops with a very inferior force. As eldest son Bohemond naturally expected to succeed his father, but when the succession opened in 1085 Bohemond was absent in Greece, and his younger brother Roger, having obtained possession of the paternal inheritance, declared his determination to maintain it. A war ensued between the brothers, but was soon followed by an arrangement which gave Bohemond nothing more than the principality of Tarentum. His ambition was too great to be confined within such narrow limits, and he resolved to try his fortune in the East as a Crusader. When this resolution was taken he was assisting his brother at the siege of Amalfi, and without waiting to complete it he harangued the troops so effectually on the glory to be gained in the Holy Land that the great body of them at once joined his standard. Bohemond was soon on his march, and after encountering considerable difficulties reached the scene of action. The Crusaders had laid siege to Antioch, but had made little progress and were beginning to despair of success, when Bohemond found means to gain over an Armenian renegade, who undertook to introduce him and his men by night, and thus give them possession of the town. Bohemond laid the matter before his fellow-chiefs, and in doing so stipulated that in the event of success he himself should be Prince of Antioch. The Armenian kept his promise, and accordingly in 1098 Bohemond was installed in his sovereignty. Though he experienced many vicissitudes he retained it ever after, and at his death in 1111 transmitted it to his son, who assumed the title of Bohemond II.

BOHLEN, PETER VON, one of the most learned and talented orientalisks of recent times, was born

at Wuppel, in Oldenburg, in 1796; died in 1840. He spent the first twenty years of his life in straitened circumstances, but his talents and perseverance attracted attention, and he obtained admission to the Hamburg gymnasium. He afterwards studied the Eastern languages at Halle and Bonn; and he obtained an appointment at Königsberg, first in 1825 as extraordinary, and afterwards in 1830 as ordinary professor of oriental literature. He died at Halle, after suffering for several years from ill-health. Bohlen has left many works, which fully support his title to the high place which he held among oriental scholars. One of the most important is a work entitled *Das alte Indien* (1830-31), which has not yet been superseded by any other work on the same subject. The details of his life are given with great minuteness and honesty in an *Autobiography* (1841), which is full of interest, and cannot be read without producing a full conviction that he was no less distinguished by his amiability in private life than by his literary acquirements.

BOHN, HENRY GEORGE, publisher, son of a Westphalian bookbinder who had settled in England, was born in London on Jan. 4th, 1796. On completing his education he worked for a time under his father, but later entered a business house in the city. About 1831 he started business on his own account as a second-hand bookseller, and in 1846 he began the issue of his famous libraries. The first of these was the *Standard*, succeeded in the following year by the *Scientific* and the *Antiquarian*, in 1848 by the *Classical*, and from then till 1853 by the *Illustrated*, the *Shilling*, the *Ecclesiastical*, the *Philological*, and the *British Classics Libraries*. The whole number of volumes contained in these series exceeded 600. In 1864 and subsequent years he sold all his copyrights and other business property, thus realizing a sum of nearly £100,000. Among his own works were: *The Origin and Progress of Printing* (1857), *Biography and Bibliography of Shakspeare* (1863), *Dictionary of Quotations* (1867), *Handbook of Proverbs*, *Handbook of Games*, *Guide to the Knowledge of Pottery and Porcelain*, and editions of Lowndes's *Bibliographer's Manual* and Addison's *Works*. He died at his residence at Twickenham on Aug. 22d, 1884.

BOIARDO, MATTEO MARIA, Count of Scandiano, was born at a seat belonging to his family near Ferrara in 1434. From 1488 to 1494, the period of his death, he was commander of the city and castle of Reggio, in the service of his protector, Ercole d'Este, duke of Modena. This accomplished courtier, scholar, and knight was particularly distinguished as a poet. His *Orlando Innamorato* (Scandiano, 1496) is continued to the seventy-ninth canto, but not completed. He immortalized the names of his own peasants and the charms of the scenery at Scandiano in the persons of his heroes and his descriptions of the beauties of nature. In language and versification he has been since surpassed by Ariosto, whom he equalled in invention, grace, and skilful conduct of complicated episodes. Domenichi, Berni, and Agostini were modelled and continued the work of Boiardo without improving it. One continuation only will never be forgotten—the immortal *Orlando* of Ariosto. In some of his works Boiardo was led by the spirit of his times to a close imitation of the ancients—for example, in his *Capitoli*; also in a comedy borrowed from Lucian's *Timon*; and in his Latin eclogues and translations of Herodotus and Apuleius. In his sonnets and *ozonetti* (first printed at Reggio, 1499) he has displayed great talents as a lyric poet.

BOIELDIEU, ADRIEN FRANÇOIS, a celebrated composer, born at Rouen in 1775; died in 1834. He early displayed great musical talent, and at eighteen

wrote an opera which was performed with great applause. In 1796 he repaired to Paris, and rose rapidly in reputation, producing several operas and various other pieces which have become classical. When the *Conservatoire de Musique* was established he was nominated a professor. In 1803 he went to Russia as *Maître de Chapelle* to the Emperor Alexander, but returned to Paris in 1811, where, among others, he produced the *Dame Blanche*, which is regarded by many as his masterpiece.

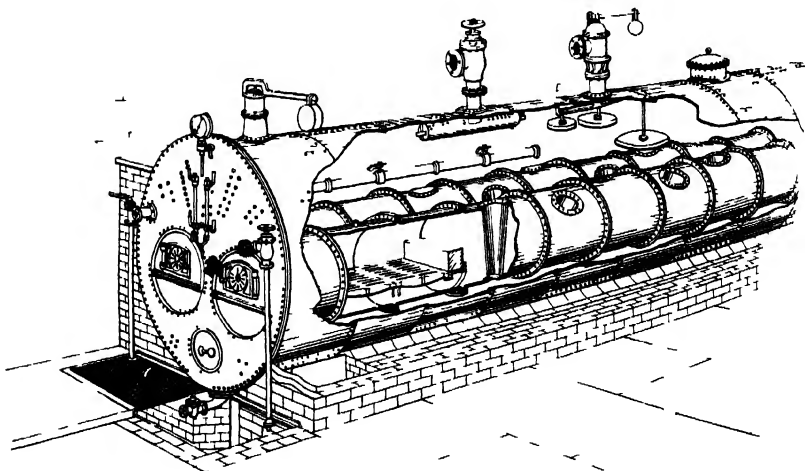
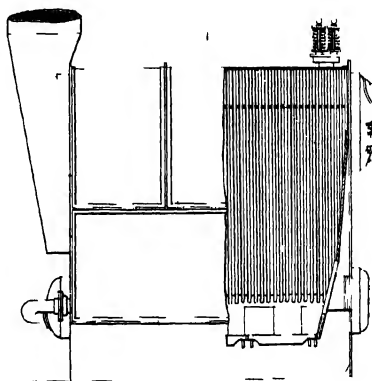
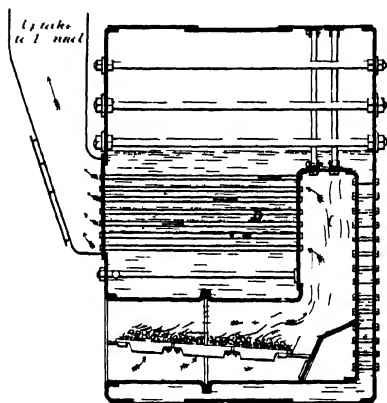
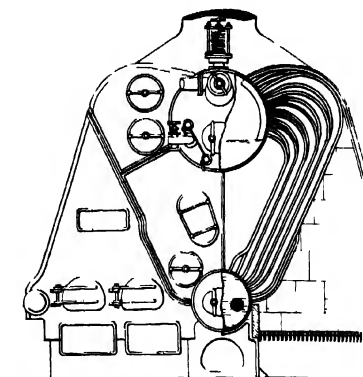
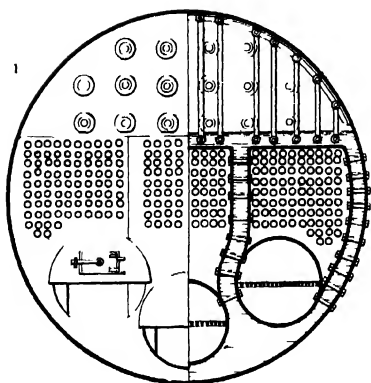
BOII, a Celtic people, who at first inhabited Transalpine Gaul. Their original seat is not exactly known, but it is supposed to have been near the territory of the Lingones, that is, between the Upper Saône and the higher parts of the Seine and Marne. They migrated to Cisalpine Gaul, crossed the Po, and established themselves between it and the Apennines, in the country previously occupied by the Umbrians. They are found, B.C. 386, engaged along with the Insubres and the Senones, two other tribes of Cisalpine Gaul, in the capture and destruction of Melpum, a neighbouring city, of which the site and history are unknown. They are said to have taken part in an expedition of the Gauls into Latium, which was defeated, B.C. 358, by the dictator C. Sulpicius. They united their forces with the Etruscans, B.C. 283, after the defeat of the Senones, and were defeated by the Romans at the Valminian Lake, the scene of a previous defeat of the Etruscans. After another defeat they made a peace with the Romans, which was preserved for forty-five years, when the occupation of the territory of the Senones by the latter led to another war, in which the Boii were again defeated. At the commencement of the second Punic war, B.C. 218, they again attacked the Romans and supported Hannibal. From this period they were engaged in almost constant war with the Romans till they were completely subdued by Scipio Nasica, B.C. 181. They were deprived of a great part of their territory, and many of them put to the sword. The remainder were at length compelled to migrate, and crossing the Alps they found a refuge among the Tauriscans, a kindred tribe who had established themselves in the territory of modern Bohemia, to which the Boii have given their name. They were afterwards driven out or exterminated by the Dacians (some say the Marcomans). Part of them migrated about B.C. 58 to Bavaria. The Boii, like the other Gauls, were a people of considerable civilization, possessing a strong love of independence, and formidable from their military disposition and virtues.

BOIL, to heat a fluid up to the point at which it is converted into vapour. The conversion of the fluid into gas takes place chiefly at the point of contact with the source of heat, and the bubbles of vapour rising to the surface, and breaking there, produce a lively commotion, attended with a slight noise, which is called *ebullition*. The escape of the heated fluid in the form of vapour prevents any further rise of temperature in an open vessel, when the boiling-point has been reached. The boiling-point of a fluid thus acquires a scientific importance. According to Tyndall, the exact definition of the boiling-point of a liquid is 'that temperature at which the tension of its vapour exactly balances the pressure of the atmosphere.' Tyndall found the boiling-point of water at the summit of Mount Rosa to be 184.92°, of Mount Blanc 184.95°. Spirits boil at the lowest temperature, pure water next, the fixed oils still higher. Water freed of air has its tension so much increased as to resist boiling for 100° Fahr. above the usual boiling-point. The boiling-point of water under the common pressure is one of the fixed points in the gradation of the thermometer. In Fahrenheit's thermometer it marks 212°, in the Centigrade 100°, and

80° in Réaumur's. This point is uniform only in case of complete boiling, and under a uniform pressure of the atmosphere. The influence of this pressure appears from experiments. In an exhausted receiver the heat of the human hand is sufficient to make water boil; while, on the contrary, in Papin's digester, where the confinement prevents evaporation, it may be heated to 300° or 400° without boiling. Under the common pressure of the atmosphere, the boiling-point of alcohol is 178°; that of mercury, 662°; that of sulphuric ether, 96°; that of oil of turpentine, 316°; that of sulphuric acid, 620° Fahr. From the experiments of Professor Robinson, it appears that in a vacuum all liquids boil about 145° lower than in the open air, under a pressure of 80 inches of mercury; water, therefore, would boil in a vacuum at 67°. Ether may be made to boil at the common temperature by merely exhausting the air from the vessel in which it is contained.

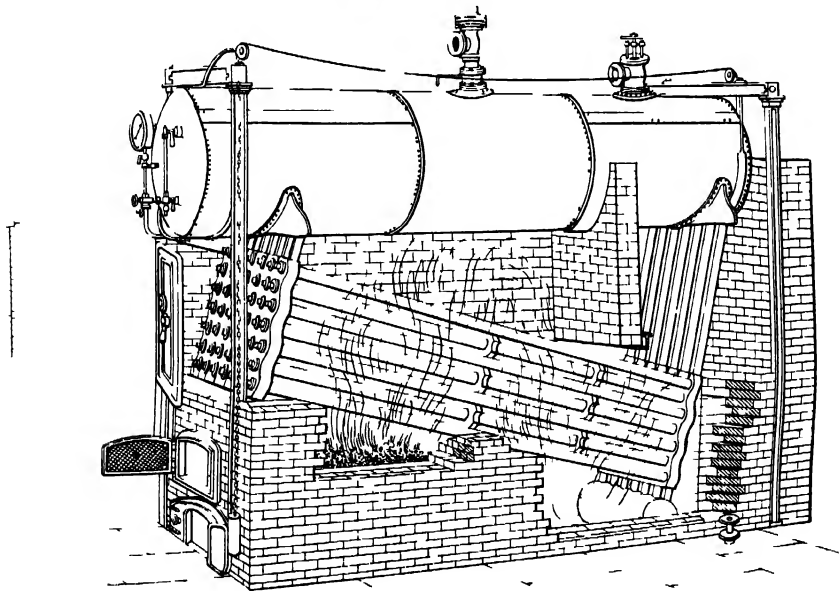
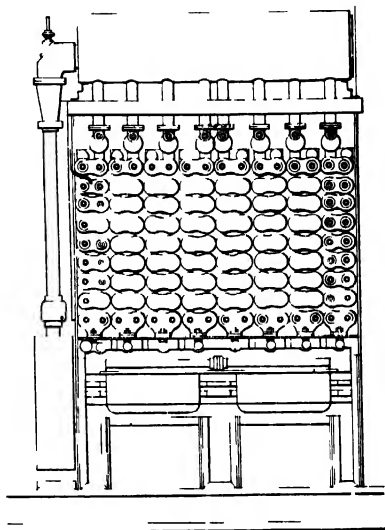
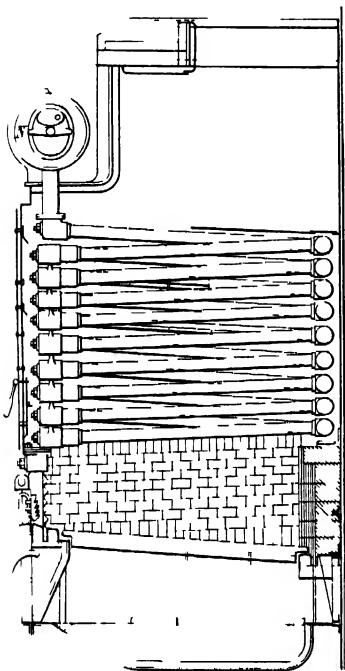
BOIL. A boil is a small tumour of a conical shape, elevated above the surface of the body. Its base is hard, while its apex is soft, of a whitish colour, and exceedingly painful. The pain in boils is generally severe and burning, and hence the name. Boils generally occur in persons of unhealthy constitutions, in those of intemperate habits, and they often arise from, or at least follow, disease of the digestive organs. They vary considerably in size. In treating a boil suppuration should be stimulated by poultices and fomentation; afterwards a free crucial incision should be made into the tumour, and the matter, together with the dead cellular tissue, or core, as it is called, must be forcibly squeezed out. If the core is adherent it must be destroyed by caustic, as it otherwise tends to keep up irritation. Attention must also be paid to the digestive organs. If these are much deranged, an emetic should first be given, followed by some gentle purgative. Afterwards Plummer's pills (calomel, antimony, and gualacum), followed by small doses of Epsom salts, may be given occasionally. Anodynes are sometimes necessary when the constitutional irritation is very great.

BOILEAU-DESPREAUX, NICHOLAS (commonly called *Boileau*), a French poet, born in 1636, at Croissy, near Paris; died 1711. He commenced his studies in the Collège d'Harcourt, and continued them in the Collège de Beauvais. Even in his early youth he read with ardour the great poets of antiquity, and tried his own powers in a tragedy, though with little success. After having completed his academical studies, he entered upon the career of the law; but soon left it from distinclination, tried some other pursuits, and resolved, finally, to devote himself entirely to belles-lettres. His first satire, *Les Adieux à Paris*, made known his talents. In 1666 he published seven satires, with an introduction, addressed to the king. They met with extraordinary applause, for no one before him had written with such elegance of versification. But in this, and in the purity of his language, and the clearness with which he sets forth his luminous principles, consists their chief merit; profound or original ideas we should look for in vain, though the pieces are not destitute of graceful touches and delicate strokes. They are unequal in merit. The satires *Sur l'Équivoque* and *Sur l'Homme* have undeniable defects. That on women, which he wrote at a more advanced age, is monotonous, and deficient in humour. His epistles, in which he is the successful rival of Horace, are more esteemed at the present day. They display a graceful versification, a natural and sustained style, vigorous and well-connected ideas. These were followed by his *Art Poétique*, in which he describes with precision and taste all the different kinds of poetry (with the exception of the *apologue*), and lays down rules for them. In regu-



Figs 1 2 Common Type of Cylindrical Boilers

3 4 Thornycroft Boiler II



11. Cornish Boiler

7. Lancashire Boiler

8. Babcock & Wilcox Boiler

larity of plan, happy transitions, and continued elegance of style; this poem is superior to the *Art Poétique* of Horace. It was long regarded, not only in France, but also in foreign countries, as a poetical code, and has everywhere had a favourable influence, as it inculcates purity and regularity, and subjects all the productions of poetical genius to a fixed standard. Boileau-Despréaux's censures of Tasso and Quinault, with some other equally unfounded opinions, display a narrowness of spirit. He had many opponents, who accused him of want of fertility, invention, and variety. To refute them he wrote his *Lutrin*, a mock heroic poem, which is still unrivalled in the eyes of the French. A music-stand, which had been removed from its place, had occasioned dissensions in a chapter: this is the subject of Boileau-Despréaux's poem, in which his art of making petty details interesting deserves as much praise as the other excellences of his poetry already enumerated. In his life, Boileau-Despréaux was amiable and generous. Louis XIV. gave him the place of historiographer, in connection with Racine, with whom he maintained the most friendly relations throughout life. They frequently submitted their works to each other for revision. The correspondence of Racine and Boileau-Despréaux is included in the collected works of both writers. As Boileau-Despréaux had attacked the academicians in several of his writings, he was not received into the Academy until 1684, and then only by the interference of the king. He died of dropsy. Among editions may be noted that of M. de St. Surin: (*Euvres de Boileau*, with a commentary, Paris, 1821-23, four vols.; an edition by St. Prix, also in four vols., which appeared in Paris in 1830; another by the same editor, with notes of all the commentators, in 1860.

BOILER, the name applied to any vessel or cauldron for boiling large quantities of liquor, but most commonly used as the designation of a metallic vessel, in which water is converted into steam by the action of fire, the steam being intended by its expansive force to give motion to a steam-engine, or to be used for a variety of manufacturing purposes. Boilers may be subdivided into the following classes: (a) Shell or tank boilers. (b) Water-tube boilers.

Shell or tank boilers consist of a large shell or tank, usually cylindrical in form with flat ends. Within this shell is contained the water and steam, so that the whole of the shell is exposed to the full pressure of the steam. In some cases the furnaces are external, but generally they are contained within the shell. The following are examples of shell boilers (see accompanying plate):—Cornish and Lancashire boilers (fig. 7), ordinary marine boilers (figs. 1, 2), and locomotive boilers. Boilers may also be classified as *flue* boilers and *multitubular* boilers; and multitubular boilers may be subdivided into *fire-tube* boilers and *water-tube* boilers. The Lancashire boiler is an example of the flue type of boiler, because there are internal flues of large diameter passing through it. Ordinary marine and locomotive boilers are examples of multitubular fire-tube boilers, because the products of combustion flow through a large number of tubes of small diameter. In *water-tube* boilers the water flows through the tubes, and the products of combustion flow over the outside of the tubes. Examples of water-tube boilers are shown in plate.

We will now give a brief description of the different types of boilers:—

Lancashire boiler, fig. 7. Boilers of this type are usually from 7 to 8 feet in diameter, and they may vary in length from 20 to 80 feet. Within the boiler are two cylindrical flues, at the front ends of which are the two furnaces. Conical 'Galloway' tubes are

usually fitted into the internal flues, as shown, for the purpose of improving the circulation of the water. At the rear end of the fire-grate is a fire-brick bridge, which serves to prevent the fuel falling over the end of the grate, but the main object of which is to cause the gases to mix more rapidly in order to facilitate rapid and complete combustion. The length of the fire-grate should not exceed 6 feet, as with a longer grate it is impossible to ensure a uniform distribution of the fuel over the surface of the grate. The bulk of the air for combustion passes through the fire, and the rest of it is admitted through gratings in the furnace doors. If the fire is thick it is impossible to ensure complete combustion without this additional supply above the fires. The boiler is cased in brick-work built in such a way as to form external flues at the sides and beneath the boiler. The products of combustion after leaving the internal flues pass down to the bottom flue, along which they flow to near the front end of the boiler; they then flow through the side flues to the rear end, and from thence into the flue leading to the economizer or chimney. The feed-water is sent by means of a pump or an injector into the boiler through the vertical pipe shown at the left-hand side of the front end, and it is discharged into the boiler through the perforations in the long horizontal pipe shown. The steam is collected by the upper perforated pipe which is shown under the stop-valve. The other important fittings are the pressure-gauge, the water-level gauges, safety-valves, and scum and blow-off cocks.

The *Marine* boiler, illustrated in figs. 1 and 2, has three furnaces, each with a separate combustion-chamber. The products of combustion flow from the combustion chambers c into the small diameter tubes d, through which they flow to the front end of the boiler, where they are discharged into the uptake. The plain tubes are expanded into the tube plates by cold rolling, but a certain proportion of the tubes are used as *stay* tubes, and these are screwed into the tube plates and have nuts screwed on to them.

In a locomotive boiler it is usual to have a fire-brick arch dividing the fire-box into two compartments, the upper of which serves as a combustion-chamber. The gases flow from the fire-box through the small-diameter tubes to the smoke-box at the front end. As a high chimney cannot be used, the draught has to be obtained artificially, and in locomotives it is always obtained by means of a steam blast, the exhaust steam from the engine cylinders being used for the purpose.

Water-tube boilers. In fig. 8 a boiler of the Babcock and Wilcox type is shown. The upper drum is kept about half-full of water, and the space above it is the steam space. The feed-water is fed into the upper drum. The main heating tubes are expanded into front and rear headers, which are sinuous in form in order that the tubes may not be in vertical planes. This arrangement ensures complete mixing of the gases as they flow between the tubes, and thus tends to increase the efficiency of the boiler. The front and rear headers are connected to the upper drum by the tubes shown, and a mud drum is connected to the lower ends of the rear headers. The circulation of the water within the boiler is due to the difference in density between the water in the rear headers and their connecting pipes, and the water and the steam in the main tubes and front headers. The flow is, therefore, from front to rear in the upper drum, down the rear pipes and upwards through the main inclined tubes and the front headers. A modified form of boiler is being built by

this firm for marine purposes, and a large number have been adopted.

The Belleville boiler is illustrated in figs. 5 and 6. The steam drum, N, is of very small diameter, about 20 inches in full-sized boilers. The heating surface consists of a number of tubes arranged in *elements*, and all the tubes in the same element are connected up in series. Each element may therefore be regarded as a flattened helix. The boiler shown contains eight of these elements. The water is fed into the steam drum, from which it flows down a pipe at each end of the boiler into a mud-box. At the lower end of each down-take pipe a non-return valve is provided. The water flows from the mud-box into a feed-distributing tube, from which it flows upwards through the various elements from which the water and steam are discharged into the upper drum. The steam and water are separated in the upper drum by a very elaborate arrangement of baffles.

In the *economizer* type of Belleville boiler the feed-water is heated before being sent into the drum, in tubes arranged similarly to those in the boiler and placed above them. When this arrangement is adopted, the number of tubes in each boiler element is reduced, and a space is left between the boiler and the economizer to form a secondary combustion-chamber. Combustion above the fire and in the secondary combustion-chamber is facilitated by the use of jets of air at a high velocity, which serve to rapidly mix the gases.

A Thornycroft boiler of the *Daring* type is shown in figs. 3 and 4. One of the most important features of the Thornycroft boiler is the arrangement of the tubes so that the discharge of water and steam into the upper drum takes place above the water-level. This ensures systematic and definite circulation, and that each tube shall do its own duty and no more. The tubes in which the steam is generated are usually about 1½ inches in diameter. A boiler of the Yarrow type has an upper steam and water drum, and two lower semi-cylindrical water chambers, the latter are connected with the former by a series of straight generating tubes. The main advantages of this type of boiler are its simplicity and its straight tubes. Both the Thornycroft and the Yarrow types of boiler are largely used for torpedo-boats and other vessels in which high speed is of the greatest importance.

Green's Economizer. This is an arrangement of vertical cast-iron tubes which is generally attached to Lancashire boilers for the purpose of heating the feed-water by means of the products of combustion after they leave the boiler. The products of combustion flow round the outside of these tubes, and the tubes are kept clean by automatic scrapers, which continuously remove the soot from the outside of the tubes.

Importance of circulation of water in boilers.—Rapid, free, and uniform circulation of the water in a boiler is of the greatest importance, because it ensures all parts of the boiler being at approximately the same temperature, and thus prevents unequal expansion. It also diminishes the chances of sediment settling on the heating surfaces, as the sediment settles most rapidly where the velocity of flow is least. Some special place should be provided within the boiler, and away from the heating surface, where the water in its circuit may be brought approximately to rest, in order that the sediment may settle out in this place. Rapid circulation of the water diminishes the chances of corrosion, because the oxygen and carbonic acid gas, which are always in solution in natural water, are swept off the surfaces immediately they are liberated from solution.

If the various currents of water within the boiler interfere with one another there will be practically still water in some places or at some times, and excessive commotion in other places or at other times, and this excessive commotion may cause serious *priming*. *Priming* is said to take place when some of the water is carried along with the steam from the boiler. The efficiency of steam-engines is greatly reduced whenever priming takes place.

Superheated steam.—The temperature of saturated steam depends on the pressure. For example, the temperature of ordinary steam at atmospheric pressure is 212° F., and when the pressure is 130 lbs. per square inch by gauge the temperature is 356° F. Steam is said to be *superheated* when it is raised to a higher temperature than that which corresponds to its pressure. If superheated steam is brought into contact with water it at once takes up some of the water, becomes saturated, and its temperature falls to that corresponding to its pressure. The superheating of steam is, therefore, effected by supplying heat to it after it leaves the boiler, and this is usually done by passing it through tubes which are heated on the outside by products of combustion. By superheating the steam initial condensation within the engine cylinder is greatly diminished or entirely obviated, and in this way the efficiency of the engine is greatly increased. The saving in coal due to superheating may amount to as much as 25 per cent even in first-class engines, and to more than this in common engines. The saving is seldom less than 15 per cent even with moderate degrees of superheating. The difficulties which were encountered when superheating was tried, about the year 1860, have now been got rid of, and it seems certain that superheating will now be adopted wherever economy in coal is of importance.

Materials used in the construction of boilers.—Boilers are now generally constructed of mild steel having a tensile strength of about 28 tons per square inch. In locomotive boilers the fire-boxes are almost always constructed of copper, although in some cases, especially in America, mild steel is used for this purpose. The tubes of locomotive boilers are made of brass, usually about 1½ inches diameter. Copper tubes were at first used for the water-tube boilers of torpedo-boat destroyers, but they have been found to be unsuitable for this purpose, and mild steel is now always used, and the tubes are best when solid-drawn. The tubes of ordinary marine boilers are usually of wrought iron or mild steel.

Selection of type of boiler.—Before deciding which type of boiler to adopt in any given case it is necessary to consider what are the controlling features: such as, in the case of land boilers, the space available, the ease or otherwise with which a boiler can be got into the building provided for it, safety, efficiency, the kind of water available, the rate of fluctuation in the demand for steam, the facility with which steam can be raised, the pressure at which the steam is required, the first cost, and the cost of maintenance. In locomotive and marine work it is of the greatest importance that the weight and bulk of the boilers shall be as small as possible, consistent with the other controlling conditions. For most purposes on land the Lancashire type of boiler is still generally preferred (where sufficient space can be provided for it and where it can be easily got into the works), for the following reasons:—(a) Its first cost and cost of maintenance are comparatively low; (b) it can be easily and thoroughly inspected and cleaned both inside and outside, hence unclean feed-water may be used in this type of boiler with greater safety than

in the case of boilers which cannot be as readily cleaned and inspected; (c) the fluctuation of steam pressure is less under irregular conditions of working than with boilers which contain a smaller quantity of water, because the water in the boiler acts as a heat-reservoir. The efficiency of this type of boiler is low under ordinary working conditions, unless it is worked in conjunction with a Green's economizer, the cost of which considerably increases both the first cost and the cost of maintenance of the plant. The great length of time required to raise steam in this type of boiler, owing to the great mass of water and brickwork which has to be heated, renders it unsuitable for those cases where steam is required intermittently for short periods. Water-tube boilers of the Babcock & Wilcox type are now being largely adopted for electric light and power stations for the following amongst other reasons:—(a) Small floor-space required, (b) the ease with which they can be got into the buildings, (c) the facility with which steam can be raised, (d) their safety from disastrous explosions. This type of boiler requires more careful stoking than other types. In densely-populated districts no other than the water-tube type of boiler should be allowed, as with it alone is there absolute security against terribly destructive explosions.

BOIS DE BOULOGNE, once a forest abounding with game near the gates of Paris, now a beautiful park belonging to the city; area, 2250 acres. The greater part of the old trees were destroyed during the revolution. When Napoleon chose St. Cloud for a summer residence, he ordered young trees to be planted, had the place inclosed with a wall, and stocked with game. In 1815 the British troops under the Duke of Wellington were stationed in it, and many of the trees were then cut down, but new ones were planted by Louis XVIII. In 1852 it came into the possession of the municipality. It is now one of the gayest holiday promenades. During the Franco-German war of 1870-71 a large number of the trees were cut down by the French in preparing for the defence of Paris. In the time of the disturbances of the Commune in 1871 several sanguinary encounters took place here.

BOIS-LE-DUC (the French name for the Dutch *'s Hertogenbosch* or *Den Bosch*), the capital of the province of North Brabant, in Holland, 49 miles s.e. Amsterdam, at the confluence of the Dommel and the Aa, which form, by their junction, the Diest. It was a strong fortress up to 1876, but has ceased to be kept as such. It is somewhat triangular in plan, and is intersected by canals. Among its buildings the chief is the cathedral, in the late Gothic style, built in 1458-98, with an old tower of the sixteenth century, and a chapel of the thirteenth, the whole recently restored. Other buildings are the town-hall, palace of justice or court-house, the episcopal palace, and the government buildings. Among educational institutions are a gymnasium, a Latin school, and a normal school for teachers. Bois-le-Duc has many industrial establishments and an active trade. Its chief manufactures are gold and silver wares, cigars, mirrors, boots and shoes, &c. The city suffered much in the religious wars of the sixteenth century, and fell into the hands of the Dutch in 1629. On September 14, 1794, the French defeated the English here, and on October 9 of the same year it surrendered to Pichegru. In January, 1814, it was taken by the Prussians, but the citadel held out. Pop. (1896), 29,584.

BOISSERÉE COLLECTION, a number of pictures exhibited in Munich, which were collected by the brothers Sulpice (1783-1854) and Melchior Boisserée (1788-1851), and John Bertram, men who, animated by love of the arts, began, at the time of

the destruction of the monasteries, during and after the French revolution, to purchase old pictures, and afterwards completed their collection by the addition of many valuable paintings of the old German school. By this collection the brothers Boisserée and Bertram happily realized the idea of a historical series of old German paintings. It is to their endeavours that we owe the discovery that Germany possessed, as early as the thirteenth century, a school of painters of much merit, which, like the Italian, proceeded from the old Byzantine school, but became, in the sequel, distinguished by excellences of its own. We owe to these collectors, also, the restoration to favour of the forgotten Low German masters, and a just estimation of John van Eyck, as the creator of the genuine German style of painting. The most distinguished connoisseurs and artists, including Goethe, Canova, Dannecker, and Thorwaldsen, have strongly expressed their admiration of this collection. It was first brought together and exhibited at Heidelberg, and afterwards removed to Stuttgart, where the King of Wurtemberg assigned it a suitable building. The collection remained there till 1828, when King Louis of Bavaria, having purchased it in the previous year for 120,000 thalers, removed it to Schleissheim, and in 1836 most of the paintings were sent to Munich. A lithographic work on this collection was published in forty parts between 1821 and 1840.

BOISSIEU, JEAN JACQUES DE, French painter and engraver, was born at Lyons in 1738, and died there in 1810. He was intended by his parents for the magistracy, but manifested such a decided inclination for drawing that he was allowed to follow it. After remaining for some time at Lyons, and painting some excellent imitations of the Flemish school, he visited Paris, where his intimacy with the most celebrated artists of the time enabled him greatly to improve his style. On his return to Lyons he devoted his attention chiefly to engraving. He afterwards accompanied the Duc de Rochefoucauld to Italy, and having studied the works of the great masters with the greatest assiduity, resumed painting; but as the use of oil injured his health, he, shortly after his return to France, abandoned it finally for engraving, in which his reputation soon became European, and his works were eagerly purchased by the most wealthy and distinguished amateurs. His engravings amount to 140 plates, among which that of *Le Charlatan*, after a picture by Karel Dujardin, is considered his masterpiece.

BOISSONADE, JEAN FRANÇOIS, a French classical scholar, celebrated for his editorial labours, born at Paris 12th August, 1774; died at Passy in 1857. He was descended of a distinguished family, and several of his ancestors had gained a reputation as men of letters. He was left an orphan at an early age, and his patrimony was dissipated by the negligence of his guardians. He was educated at the Collège d'Harcourt, and at the age of eighteen was attached to the ministry of foreign affairs. In 1801 Lucien Bonaparte named him secretary-general of the prefecture of the department of Haute-Marne, but the temper of his superior soon compelled him to give in his resignation, and he abandoned public life. He had already become a contributor to periodical literature in the *Magasin Encyclopédique* of Millin and the *Journal de l'Empire*, the precursor of the *Journal des Débats*. Ancient and modern literature, both French and foreign, grammatical criticism, bibliography, and natural sciences occupied his pen. His career as a journalist extended to 1813, at which date he was admitted a member of the Academy of Inscriptions and Belles-Lettres. He afterwards wrote about 150 articles for the *Bibliographie Universelle*. He was offered the chair of Greek literature

at Genoa, and afterwards the rectorship of the Academy of Strasburg, but preferred to continue his studies among the manuscripts of the imperial library. He became in 1809 assistant of Larcher, as Greek professor of the Faculty of Letters in Paris, and four years afterwards he succeeded him both in the Faculty and in the Institute. Finally, in 1828, he was called to the chair of Greek literature in the College of France. From this time he devoted himself entirely to his duties as a professor, and his labours as a classical editor. He has produced no complete work in French, but is said to have written Latin with natural grace and elegance, and his editions of the classics are highly esteemed. His editorial labours were also extended to a few French works, and he translated a heroic-comic poem, the *Genpillen*, from the Portuguese.

BOISSY D'ANGLAS, FRANÇOIS ANTOINE, COMTE DE, a French statesman of the revolutionary period, was born at Saint Jean-la-Chambre, near Annonay, in 1756; died at Paris, 20th Oct., 1828. He studied at Annonay, and was admitted as an advocate to the parliament of Paris. In 1789 he was elected at Annonay to the states-general, where he was a moderate advocate of revolutionary principles, in support of which he wrote at this time various brochures. In 1792 he was returned as a deputy to the Convention. He voted against the death of Louis XVI., and after the fall of Robespierre he was appointed secretary of the Convention, and a member of the Committee of Public Safety, and intrusted with the provisioning of Paris at a time of famine, a task which he does not appear to have executed satisfactorily. He was made a member of the Council of Five Hundred in 1795, president of the Tribunal in 1803, senator and commander of the Legion of Honour in 1805, was created a peer by Louis XVIII. in 1814, but supported Napoleon during the Hundred Days, and was consequently expelled from the peerage by a royal ordinance, but shortly afterwards reinstated. He was from 1803 a member of the consistory of the Reformed Church, a member of the Institute from its commencement, and on its reconstruction in 1816 he became a member of the Academy of Inscriptions. He wrote an essay on the life and writings of Malesherbes (Paris, 1819-21); *Études Littéraires et Poétiques d'un Vieillard*, five vols. duodecimo, Paris, 1825.

The fame of Boissy d'Anglas rests chiefly on a scene in the Convention in 1795, when the hall was invaded by an angry mob, demanding bread and the constitution of 1793. Called temporarily to take the chair, in the absence of the president, Boissy had presented to him the head of a deputy, Féraud, which had been cut off by the insurgents and placed on the end of a pike. He saluted it, and continued calmly facing the mob, and to his courage and firmness the safety of the Convention at this crisis is attributed. Such is the popular version of a story of which the most various and contradictory accounts are given. It has been said that Boissy d'Anglas exhibited no such courage as has been attributed to him, and that he was merely kept in his place by the pressure of the mob. His enemies, who accused him of reactionary tendencies, even said the insurrection was got up by the reactionary party to discredit the revolution, and that Boissy was in understanding with the leaders of the mob. For this last accusation there appears to be no foundation, but it is quite likely the scene may have been represented in a more dramatic form than as it actually occurred.

BOJACA, BATTLE OF, so called from having been fought near the bridge of the small town of Bojaca, not far from the city of Tunja, between the Spaniards under Barreyro, and the united forces of Venezuela

and New Grenada commanded by Bolívar. It occurred August 7th, 1819, and was decisive of the independence of New Grenada. Among the republicans, Generals Anzuategui, Páez, and Santander distinguished themselves; and the Spaniards sustained a total defeat, their general, most of their officers and men who survived the battle, together with all their arms, ammunition, and equipments, falling into the hands of Bolívar. So complete was the destruction of the Spanish army, that the viceroys instantly fled from Santa Fé, leaving even the public treasure a prey to the conquerors.

BOJADOR, CAPE, a promontory on the w. coast of Africa; lat. 26° 7' 10" N.; lon. 14° 29' W.; is one of the projecting points of the great desert of Sahara, and forms the w. extremity of a rocky ridge called the *Jebel-khal* or Black Mountain. The coast N. of this cape is extremely dangerous, being shallow to a great distance out, and constantly enveloped in a haze. It has been, in consequence, the scene of many a melancholy disaster. Cape Bojador was long the limit of navigation towards the S. and was first passed by the Portuguese in 1483.

BOJANO, a town of Naples, in the province of Molise, 10 miles S.W. of Campobasso. It is situated on the *Bijerno*, in a defile at the foot of Mount Matese. It is the seat of a bishop, and has a cathedral and several churches. Bojano is chiefly distinguished as the site of the ancient *Bovianum*. Pop. 2981.

BOKHARA, or **BOCHARA**, a khanate of Central Asia, practically vassal to Russia, bounded on the north by Russian Turkestan, west by Khiva and the Russian Trans-Caspian Territory, south by Afghanistan, and east by Russian Turkestan. It formerly occupied considerably more territory than it does now, having been reduced by the conquests and encroachments of Russia, which have been only partially compensated by some additions. The present area of the khanate is estimated at about 93,000 square miles. The country is to a great extent occupied by deserts, and low and naked ranges of mountains, and the cultivated portions of it are confined to the valleys of the rivers, especially the Oxus or Amoo Daria, which forms the southern boundary for a considerable distance, and then flows from south-east to north-west parallel to and not far from the frontier of the country. Bokhara lies between 37° and 41° N. lat., and in greater part is no more than 1100 or 1200 feet above the level of the sea, but in the extreme east is mountainous. The climate is subject to great extremes, being warm in summer and very cold in winter. There is very little rain, on which account it is necessary to resort to artificial irrigation. Besides cereals, cotton, tobacco, and vegetables are cultivated, and there is abundance of fruit. The total population amounts to about 2,150,000, and consists of the Uzbeks, who are the ruling race, and to whom the emir belongs; the Tajiks, who form the majority in the capital; the Kirghizes, less numerous than the Tajiks; about 60,000 Arabians, descendants of the soldiers who were brought into the country by the third caliph of Bagdad on the occasion of the conquest of Turkestan; Persians, who have chiefly been brought as slaves to Bokhara; Turcomans, Hindoos, and about 10,000 Jews who live in the towns beyond the protection of the law, and accordingly oppressed by the other inhabitants. Since the separation of Samarkand there are now only two towns of any importance in Bokhara, namely, the chief town Bokhara, with a pop. of about 70,000; and Karshi, with about 25,000. Besides these there are a few small towns and some hundred villages in the country. The capital, according to Vámbéry the centre of Tartar civilization, is ill-built

and has a gloomy aspect, and in luxury of dress and mode of life is far behind the towns of Western Asia. Among the people there reigns the utmost moral corruption along with a rigorous adherence to outward forms. The country is distinguished from the other countries of Central Asia by its numerous schools, and in the same proportion by the amount of culture diffused among the people generally; but the women are even more degraded than in other Mohammedan countries. The rule of the emir is absolute, although he is to some extent under the influence of the clergy. The manufactures are unimportant, but there is a very considerable caravan trade, cotton, rice, silk, and indigo being exported, and woven goods, sugar, iron, &c., being imported. There is also now a trade by railway, since the making of the line from the Caspian to Samarkand. Bokhara is remarkable for its religious fanaticism, and various European travellers have been exposed to danger. After Alexander Burnes had visited Bokhara on a commission from the government of India in 1832, the British ambassador in Teheran sent Colonel Stoddart in 1838 to obtain from the Emir Nasrulla the deliverance of the Russian prisoners that he had taken on his predatory incursions into Russian territory. Nasrulla, however, irritated at the neglect to answer his letter to the Queen of England, ordered Colonel Stoddart to be thrown into prison, and after treating him with great cruelty, compelled him to acknowledge the Mohammedan creed. Captain Conolly, who had been with a similar object in Khiva and Khokand, came in 1841 to Bokhara, and after having to submit to the same treatment as Colonel Stoddart, was executed along with him in 1842. Information of their fate was brought to Europe by the missionary Wolff, who had been sent to Bokhara in 1843 for this purpose. See Wolff's *Narrative of a Mission to Bokhara*, 1843-45 (London, 1845).

In 1850 the Russians established themselves at the mouth of the Sir (Jaxartes), where it flows into the Sea of Aral, and in 1864 they found it necessary to proceed further up the river. They made themselves masters of the two towns Turkestan and Aul-e-ata, and after bringing them into communication with one another, invested Chenkend, Niazbek, and Chinal. The land thus occupied, which up to that time had formed the northern half of the khanate of Khokand, was, along with some other districts that had previously been annexed to Russia, erected into the Russian government of Turkestan, and incorporated with the general government of Orenburg, by the ukase of Feb. 14 (26), 1865. By a subsequent ukase, dated July 11 (23), 1867, this territory was constituted a general government. Soon after the Khan of Khokand invaded the Russian territory, in consequence of which the Russians advanced still further, and attacked Tashkend, which they took on the 28th of June, 1865. They did not, however, incorporate Tashkend with the Russian territory, but declared it an independent khanate under the protection of Russia. This arrangement was opposed by Muzaffer-Eddin, emir of Bokhara, whereupon the Russian general Romanovski again assumed the offensive, and marching into Bokhara took Khojend by storm on the 5th of June, 1866. In this way Russia came into the possession of the whole basin of the Sir. Not long after Tashkend was incorporated with the Russian territory by the desire of the inhabitants. Meanwhile the war with Bokhara still went on, and peace was not concluded till the beginning of 1867. This peace, however, did not last long. The war was renewed in the spring of the following year, and it was only in July, 1868, that the terms of peace between Russia and Bokhara were finally agreed upon. Bokhara was to give up

Samarkand and Katti Kurghan, along with the surrounding districts (constituting the tract of land watered by the Zerafshan), and at the same time promised to pay an indemnity to Russia and to protect her trade. Since then the peace has not been broken, but the Emir of Bokhara has sunk more and more into a position of entire dependency on Russia. During the autumn the Russians intervened against the emir's son, who had risen in revolt against him, and on the 12th of October in the following year the emir sent an embassy with presents (tribute) to the czar at St. Petersburg. In the meantime Muzaffer-Eddin had fallen into a dispute with Afghanistan (Cabul). Shere Ali Khan, of Cabul, had given a favourable reception to the rebellious son of the emir, and Muzaffer-Eddin, probably in consequence of encouragement from Russia, now thought himself able to make good his former claim to Badakshan, and the territory lying about the sources of the Oxus, especially since the Khan of Cabul seemed to have but a slight hold of these parts. He had accordingly already sent out an army with the view of conquering those parts, when, towards the end of 1869, pressure being put upon him by Russia, he concluded a treaty with Cabul by which the Oxus was fixed as the boundary of the continuous states, and this boundary was afterwards recognized by Russia and England. After the Russian expedition to Khiva in 1873 an agreement was come to between Russia and Bokhara on the 28th of Sept. of that year, according to which Bokhara received a portion of the territory that had been ceded by Khiva to Russia, while the Russians received various privileges in return. Muzaffer-Eddin died in 1885, and was succeeded by his son Abd-ul-Ahad. Bokhara will probably soon be completely placed under Russian administration, for what little power it had lapses in 1884 by the practical absorption of the country, resulting from the annexation of Merv. Since 1885 the troops, which were formerly ill-trained and badly armed, have been drilled by Russian instructors and armed with rifles.

BOKHARA, the capital of the above khanate, in lat. 39° 48' N.; lon. 61° 26' E. It is 8 or 9 miles in circuit, and is surrounded by a mud-wall. It is poorly built, consisting of extremely narrow streets and paltry houses. The principal edifices are the palace of the khan, crowning a height near the centre of the town and surrounded by a brick wall 70 feet high; and numerous mosques, the largest of which is enamelled with tiles of azure blue, and has a tower 210 feet high. The trade was formerly large with India, but has now been almost completely absorbed by Russia. The pop. is estimated at 70,000.

BOLAN PASS, a celebrated defile in the Hala mountains, leading from Sind into Beluchistan. It is about 60 miles long, hemmed in on all sides by lofty precipices, and in parts so narrow that a regiment could defend it against an army. It is traversed by the Bolan river. The crest of the pass is 5800 feet high.

BOLBEC, a town, France, department of Seine-Inférieure, 17 miles S.N.E. of Havre; agreeably situated on the side of a hill, washed by the Bolbec, and at the junction of four valleys. It is a thriving and industrious place, and well situated for commerce. Its printed cottons and handkerchiefs have long been held in high estimation. Besides these it produces linen and woollen stuffs, lace, cotton, velvet, and thread, and has several dyeworks and tanneries, with a considerable trade in grain, horses, and cattle. Pop. (1896), 11,300.

BOLE, an earthy mineral which occurs in amorphous masses, and is composed chiefly of silica with about 20 per cent of alumina and 10 of iron. It is

of a dull yellow, brownish, or red colour, has a greasy feel, and yields to the nail. It has a conchoidal fracture; its streak is shining, and it is opaque or slightly translucent. It is found in various localities, such as Armenia, Saxony, Tuscany, and the isle of Skye in Scotland. In ancient times, under the name of Leronian bole or earth, it had a place in the materia-medica, but is no longer used. At present the only bole of commerce is a coarse pigment sold under the name of Berlin and English red.

BOLERO, the name given by the Spaniards to a number of their national dances of the ballet class, which in Spain are regularly performed in theatres between the different pieces. They are danced both by men and women, the male dancers who take part in these performances being also called *boleros*, while the females are called *boleras*. The dances of this class which are best known and most in vogue are known by such names as the *Cachuca*, *Jota aragonesa*, *Madrileña*, *Ole*, *Jaleo de Jerez*, &c. They are danced by one or more couples, or, as in the case of the indecent *Ole*, by a single female dancer. The dancers wear the Andalusian costume, partly because of all the national dresses of Spain this is the richest and most elegant, and partly because the greater number of the boleros are of Andalusian origin. The music for these dances is always played by the orchestra, and is generally marked by rapid changes of time. The melodies are often very beautiful, and are always based upon some of the national airs. The dancers must beat time to the music with the castanets (*castañuelas*). These dances, when the performers are well trained and handsome, have a very powerful effect on the spectators, consisting as they do of graceful attitudes and movements of the body, and being strictly speaking not dances, but pantomimes. The dancers endeavour to express by their gestures all the different phases of the passion of love, and this often in a manner which passes far beyond the bounds of modesty. The dances of the common people, on which the boleros are founded, are essentially distinguished from the latter by the fact that the former are accompanied by singing—partly that of the performers, partly that of the spectators—while the music is mostly supplied by the guitar, or in some cases by the tambourine. They are very simple, but at the same time very graceful. The dancers beat time with the castanets, as in the boleros properly so called.

BOLESŁAS, the name of six kings of Poland and three of Bohemia. The most celebrated of them, Bolesław, surnamed the Great, and the first Polish sovereign who had the title of king, was son of Duke Mieszko I., and succeeded him in 999. He completed the work of introducing Christianity which his father had begun, contributed greatly to the progress of civilization, and brought the army under regular discipline. The Emperor Otto III., who had begun to entertain some suspicions of him, resolved to ascertain his real character by visiting him in person, and was so much pleased with the deference with which he was received, that he crowned him with his own hands in 1001, and exempted him from all homage and tribute. Bolesław assumed the splendour of his new dignity, and became a powerful sovereign. He not only repelled an aggression on his territories by the Duke of Bohemia, but became in his turn the aggressor, and conquered Moravia. Success awakened a desire for new conquests, and the Russians, who hitherto had always been the aggressors, were attacked in their turn, and were obliged to purchase peace by the cession of large tracts of territory. He afterwards turned his arms to the S. of Germany, and compelled the greater part of the northern sovereigns to become his tributaries. In 1012 a formid-

able league was formed against him by the Emperor of Germany and the Dukes of Bohemia and Austria; but the allies, after sustaining serious reverses, were glad to conclude a peace with him in 1018. His last campaign was against the Russians, whom he signally defeated in a great battle on the banks of the Bug. After twenty years of continued warfare he was permitted to enjoy peace, and effected numerous internal improvements, promulgating excellent laws, and even putting a check upon his own power by the appointment of a council of twelve to act as mediators between the sovereign and the people. This body was the germ of the Polish senate. Bolesław died in 1025, after a reign of twenty-six years, which is one of the most glorious in the annals of Poland, and has handed down his name as one of the greatest sovereigns of his time.

BOLETUS, a genus of fungi of the order Hymenomycetes (fungi provided with a cap and a fructiferous membrane or hymenium which covers the sporules contained in the tubes). The greater number of the species are globose, from which the Italians call them *ovoli*. The characters of the genus are, broad, hemispherical cap, the lower surface formed of open tubes, cylindrical in form, and adhering to one another. The tubes can be separated from the cap, and contain little cylindrical capsules, which are the organs of reproduction. They differ from the Polyporei by the absence of the membrane which incloses the tubes. *Boletus edulis* has the pedicle thick, especially at the base, and marked with red and pale white. The cap is also thick, smooth, and fawn-coloured. The tubes are very small, rounded, and pass from white to a greenish yellow. It grows on the ground abundantly in woods during summer. The flesh is firm, and has an agreeable nutty flavour. It is a considerable article of commerce in France, particularly around Bordeaux. It is also found in England, but more rarely. The other species of *Boletus* are numerous. See plate at FUNGI.

BOLEYN, ANNE, second wife of Henry VIII. of England, was the eldest daughter of Sir Thomas Boleyn, and Elizabeth Howard, daughter of the Duke of Norfolk. She was born, according to some accounts, in 1507, but according to more probable ones about the year 1501. She attended Mary, sister of Henry, on her marriage with Louis XII., to France, as lady of honour. On the return of that princess, after the king's death, she entered the service of Queen Claude, wife of Francis I., and after her death that of the Duchesse of Alençon, sister of the French king. Young, beautiful, gay, and witty, she was an object of great attraction in the gallant court of Francis I. She returned to England about 1522, and became lady of honour to Queen Catharine, whom she soon supplanted. The king, passionately enamoured of her, found an unexpected opposition to his wishes, and Anne firmly declared that she could be had on no terms but those of marriage. She knew that the king already meditated a divorce from his wife, Catharine of Arragon; but she also knew what difficulties the Catholic religion opposed to the execution of this plan. Cranmer offered his services to bring about the accomplishment of the king's wishes, and thus gave the first occasion to the separation of England from the Roman Church. But the impetuous Henry did not wait for the ministers of his new religion to confirm his divorce: on the contrary, he married Anne in January, 1533, having previously created her Marchioness of Pembroke. When her pregnancy revealed the secret, Cranmer declared the first marriage void, and the second valid, and Anne was crowned queen at Westminster with unparalleled splendour. In 1533 she became the mother of the famous Elizabeth. She could not, however, retain

the affections of the king, as inconstant as he was tyrannical; and as she had supplanted her queen while lady of honour to Catharine, she was now supplanted herself by Jane Seymour, her own lady of honour. Suspicious of infidelity were alleged, which appear to have had no foundation in truth, but were doubtless eagerly laid hold of by Henry as a colour for his violent proceedings. In 1686 she was accused, and brought before a jury of peers. Smeaton, a musician, who was arrested with others, asserted that he had enjoyed the queen's favours, and May 17, 1688, she was condemned to death by twenty-six judges. Anne in vain affirmed that she had long before been contracted to the Duke of Northumberland, and therefore had never been the lawful wife of Henry. Cranmer in vain declared the marriage void. The sentence of death was executed by the command of the inflexible Henry, who esteemed it a great exercise of clemency to substitute the scaffold for the stake. The last day of the life of this unhappy woman, May 19, 1688, presents many interesting moments. She sent for the wife of the Lieutenant of the Tower, threw herself upon her knees before her and said, 'Go to the Princess Mary (daughter of Catharine) in my name, and in this position beg her forgiveness for all the sufferings I have drawn upon her and her mother.' 'She sent her last message to the king,' says Hume, 'and acknowledged the obligations which she owed him in uniformly continuing his endeavours for her advancement.' 'From a private gentlewoman you have made me first a marchioness, then a queen, and as you can raise me no higher in this world, you are now sending me to be a saint in heaven.'

BOLINGBROKE, HENRY ST. JOHN, VISCOUNT, a distinguished statesman and political writer, was born in 1678 at Battersea, near London, of an ancient family, and died in 1761. He completed his studies at Oxford, where he early exhibited uncommon talents and attracted general attention. On entering the world he displayed a rare union of brilliant parts and elegance of manners, with beauty of person, dignity, and affability, and such fascinating eloquence that, according to the unanimous testimony of his contemporaries, nobody could resist him. Unfortunately the passions of his youth opposed the development of his talents; and in his twenty-third year he was distinguished principally as an accomplished libertine. His parents, supposing that marriage would have a salutary influence upon him, proposed to him the daughter of Sir Henry Winchcomb, a lady the heiress of a million, who united with a charming figure a cultivated mind and noble birth. But the young couple had lived but a short time together when irreconcilable disputes arose between them, in consequence of which they separated for ever. Another plan was adopted to give a better direction to the impetuous character of Bolingbroke. By the influence of his father he obtained a seat in the House of Commons. Here his eloquence, his acuteness, and the strength of his judgment attracted universal attention. His former idleness was changed at once into the most incessant activity. In 1704 he was made secretary of war, and came into immediate connection with the Duke of Marlborough, whose talents he discerned and whose enterprises he supported with all his influence. When, however, the Whigs gained the ascendancy in 1708, Bolingbroke gave in his resignation. Now followed, as he said himself, the two most active years of his life, in which he devoted himself to study, but by no means neglected public affairs. He continued to maintain a constant intercourse with the queen, who preferred him to her other counsellors. The Whig ministry was overthrown to the astonishment of all Europe in 1710, and Bolingbroke received the department of

foreign affairs. In 1712 he was called to the House of Lords by the title of Viscount Bolingbroke, and in 1713, against much popular opposition, he concluded the Peace of Utrecht, of which he was always proud. In concluding this peace everything was unfavourable to him—the Whigs, the peers, the bank, the East India Company, Marlborough, Eugene, the emperor, Holland, the jealousy of all the European powers, the weakness of his own queen, the irresolution, imprudence, and even the envy of his colleagues. Bolingbroke afterwards became a prey to the impetuosity of his passions, and exhibited a fickleness of conduct that has rendered his loyalty, his patriotism, and his whole character suspected. The collision of the Whigs and Tories produced such a general excitement that the ministers were attacked, the peace was decried as disastrous, and the Protestant succession was declared in danger. At this moment a fatal contention broke out between the lord-high-treasurer (the Earl of Oxford) and Bolingbroke, immediately after the conclusion of the peace. Swift, the friend of both, but particularly intimate with the lord-high-treasurer, accused Bolingbroke of having principally contributed to the ruin of their party. Be this as it may, Queen Anne, provoked to the utmost by Oxford, dismissed him four days before her death, and made Bolingbroke prime-minister. But the death of Anne changed the whole scene. George I. of Hanover ascended the throne, and the Whigs triumphed more completely than ever. Bolingbroke, who could not impose on the Hanoverian court by his plausible pretences, and who was as much envied as he was hated, was dismissed by King George while yet in Germany, and fled to France in March, 1715. In August of the same year he was attainted. James III., the Pretender as he was called, invited him to Lorraine, and made him his secretary of state. But when Louis XIV. died Bolingbroke lost all hope of the success of the Pretender, and repented of having entered into so close a connection with him. Whatever the feelings and plans of Bolingbroke may have been, his intentions with regard to James III. were doubtless honest. Nevertheless, the latter deprived him of his dignity and transferred it to the Duke of Ormond. Thus it was the strange fate of Bolingbroke to be charged with treachery both by the king and the Pretender. Offers were made to him by King George, on condition of his revealing the secrets of the Pretender. This proposal he at first declined, but he afterwards yielded so far as to promise a decisive blow against the cause of the Pretender on condition of the total oblivion of what had already passed, and of an entire confidence for the future. Walpole, however, was afraid of Bolingbroke's influence in Parliament, and opposed his recall. Bolingbroke, in order to forget his situation, applied himself to writing philosophical consolations after the manner of Seneca, but soon found sweeter ones in his marriage with a rich and amiable lady, niece of Madame de Maintenon. In 1723 the Parliament which had been so hostile to Bolingbroke was at length dissolved, and he was permitted to return to England. His estates, however, were not restored until two years after by a particular act of Parliament. On his return he lived at first retired in the country, maintaining, however, a correspondence with Swift and Pope. But no sooner was the voice of opposition heard in Parliament than he hastened to London, and, as the restoration of his seat in the House of Lords was still denied him, attacked the ministry during eight years in the journals or in pamphlets with great success. He drew upon himself powerful enemies, against whom he directed his *Treatise on Parties*, which is considered as his masterpiece. He then returned to France with the inten-

tion, as even Swift supposed, of throwing himself into the arms of the Pretender's party, against which charge Pope defended him, and declared that he had himself advised his noble friend to leave an ungrateful country, by which he was suspected and persecuted. In France, Bolingbroke wrote (1735) his *Letters on the Study and Use of History*, which are admired even at the present day, but in which the individual character of the author appears to the exclusion of general views, and which were blamed, in particular, for attacking revealed religion, which he had once warmly defended. In 1729, in the midst of his contest with Walpole, he had suggested to Pope his *Essay on Man*, and supplied him with the most important materials. He wrote (1738) his *Idea of a Patriot King* under the eyes of the heir-apparent. From 1766 he lived at Battersea, where he died in his seventy-fourth year. He bequeathed his manuscripts to David Mallet, who published an edition of his collected works in five vols. 4to, in 1754; but scarcely had they appeared when a general cry was raised against them on account of their attacks on Christianity. Bolingbroke was capable of inspiring the warmest friendship and the bitterest enmity. He was accused of immoderate ambition, and of a proud, passionate, envious, and implacable temper. See Bolingbroke, a *Historical Study*, by J. Churton Collins (1886), and the *Life* by Thomas Harrop (1834).

BOLIVAR, SIMON, surnamed *El Libertador*, the South American patriot, was born at Caracas, in the present republic of Venezuela, on July 24th, 1783. He inherited a considerable fortune, and was thus enabled to study law at Madrid and visit several other European cities. Returning to his native country, he took part in the revolt against Spain in 1810; and in the war which followed the declaration of independence by Venezuela in 1811 he played an important part, first under General Miranda and afterwards as the commander of a separate force. He defeated the Spanish forces in several battles, and in August, 1813, entered Caracas in triumph. He was proclaimed dictator, but ere long he was compelled to flee from the city and finally from the continent. While at Kingston, in Jamaica, he narrowly escaped assassination at the hands of a Spanish hireling. In 1816 he again landed in Venezuela with an army, and after several battles in which he met with varying success he was chosen president by a congress held at Angostura in 1819. New Granada was soon added to the republic as the result of victories gained at Tunja and Boyaca, the enlarged state being named Colombia. In 1821 the insurgents finally triumphed at Carabobo, and three years later the Spanish troops no longer remained in the country. Ecuador was conquered in 1822, and Peru was wrested from the Spaniards during the next two years. Part of the latter country was detached to form a separate state named in honour of him, Bolivia, and of this he became president for life. In 1826 Columbus re-elected him to the presidency, and three years later Venezuela seceded to form a separate republic. In 1830 he resigned the presidency, and on Dec. 17th of that year he died at San Pedro, near Santa Martha. His remains are now deposited at Caracas, where also a monument has been erected in his honour. In 1863 the centenary of his birth was celebrated with great enthusiasm. See the *Life* by Larrazabal (New York, 2 vols., 1866).

BOLIVIA, formerly called UPPER PERU, one of the independent republics of South America formed after the Spanish colonies in that continent had definitely won their freedom by the decisive battle of Ayacucho (Dec. 9, 1824), was named after Bolivar,

the subject of the preceding article. It is bounded on the N. by Brazil, on the E. by Brazil, on the S. by the Argentine Republic and Paraguay, and on the W. by Peru and Chile. Authorities vary greatly as to the area of Bolivia, the boundaries not being everywhere well defined. According to an estimate in the *Almanach de Gotha* for 1897 the area is only 435,000 square miles, but some estimates make it as much as 570,000 square miles. As a result of the war with Chile, Bolivia ceded to that country her coast territory, covering about 29,000 square miles, with a population of 22,000. The total population, according to statistics collected by the Bolivian government in 1890-93, amounts to 2,270,000. An unascertained proportion of the inhabitants belong to the aboriginal races of the country (the Aymaras and the Quichuas), and a large number consist of *Mestizos* or descendants of the Spaniards by native women. The two Indian races speak distinct though cognate languages. The largest town is La Paz, but the executive government has its seat at Sucre or Chuquisaca. Bolivia is as yet but poorly provided with railways. A line, however, has recently been finished which connects the Bolivian town of Oruro with the Chilean seaport town of Antofagasta, about 300 miles of the line being in Bolivia. A line is also to be made from La Paz to Lake Titicaca, whence there is already a railway to Mollendo on the Pacific.

There is no country in the world, perhaps, possessing such a variety of soil and climate, of physical aspect and productions, as Bolivia. Nowhere else are to be seen such contrasts of nature, exhibited in close juxtaposition, on so grand a scale. The broadest part of the Andes, where these mountains, encompassing the great Lake of Titicaca and the Lake of Aullagas, 160 miles farther S., divide into two chains, known as the Eastern and Western Cordilleras, lies mainly within the limits of this state in its western portion. This double range of lofty mountains presents to the W. nothing but an abrupt and uniform ridge, while the eastern branch throws off extensive ramifications which extend a long way from the Cordillera, forming numerous valleys which run nearly from N. to W., and pour their waters, some into the Pilcomayo, an affluent of the La Plata, and hundreds of others into the Mamoré, Beni, and other great affluents of the Amazon. These streams are likely to be, in course of time, of immense importance to Bolivia in developing her commerce towards the Atlantic. Beyond these spurs of the Eastern Cordillera Bolivia presents a new aspect. The mountains cease, and are succeeded by a plain exceeding Great Britain in superficial extent, in which no stone, nor even a pebble, is to be found, and which is annually flooded to such a degree by the numerous great rivers which run through it, that communications by boat are practicable across it in nearly all directions. This is the country of the Moxos. Beyond this, towards the Paraguay, the plain rises, in general, above the reach of inundation, and rocks and hills of moderate height again make their appearance. This is the country of the Chiquitos. A great part of Eastern Bolivia is yet very imperfectly known, and remains in its pristine state of a wilderness untouched by the labours of the agriculturalist. A number of the mountains of Bolivia attain a height of about 20,000 feet, and several of them surpass this, though few reliable measurements of heights are attainable. The highest are Sorata or Illampu (21,484 feet), and Illimani, which some make rather lower, others higher than Sorata. (See *ANDES*.)

The climate of Bolivia is as various as its physical aspect and conformation. On the more elevated parts

in the N.W. there is frost every night, but the sky is always bright and cloudless, and the air dry; while the lower parts of the country are, on the other hand, moister and hotter. The inhabitants distinguish three regions of climate, the Puna, Paramo, and Yungas. The first is elevated and cold, the region of the llama and alpaca. The country round Lake Titicaca comes, for the most part, under this denomination. The second or middle region is temperate and productive, and having now a considerable mixture of European inhabitants, produces the usual European grains and fruits. The third region, that of the valleys, has a decidedly hot climate, and is distinguished by a rank vegetation. With all this difference of climate, Bolivia is nevertheless unsurpassed in point of general salubrity. It has but rarely been visited by epidemics, and cholera and yellow fever, the two great scourges of some portions of South America, are here unknown.

The natural wealth and resources of Bolivia are immense. It has long been famed for its mineral wealth, for the Peru of the old Spaniards which was so famous for the treasures drawn from it was no other than the present Bolivia, Upper Peru. The celebrated Potosí was once the richest silver district in the world, and yielded, between 1556 and 1875, £400,000,000. It still yields silver, but the richest mine now worked is that of Huanchaca. Considerable quantities of tin and copper are also obtained. The country is capable of producing every product which is known to South America. The warm and well-watered valleys supply corn and fruit. In the Yungas the chief objects of culture are, among others, coffee (said to be excellent), cocoa, tobacco, maize, and sugar-cane. From the forests are obtained india-rubber, cinchona, and other products. The mountains and elevated tracts are well-stocked with animals such as the sheep, llama, alpaca, &c. The Bolivians have been prevented from taking anything like full advantage of their vast natural wealth, by the want of seaports and suitable means of communication with the Pacific on the west, and by the cataracts and rapids of the Madeira that prevent free navigation by the Amazon, which otherwise would be the natural outlet for their commerce on the east. As already mentioned, however, there is now railway communication with the Pacific; and a railway will probably be constructed round the Madeira rapids. Thus 3000 miles of navigable Bolivian rivers (half of them admitting steamers drawing 6 feet) will be put in connection with the main river.

The executive power in Bolivia is in the hands of a president elected for four years, and the legislative belongs to a congress of two chambers, both elected by universal suffrage. The revenue of the state is usually about £1,000,000. The finances are not in a very satisfactory condition, as the expenditure usually exceeds the revenue. There are no reliable figures regarding the public debt. The imports and exports are roughly estimated at about £2,500,000 and £3,200,000 respectively. The chief exports are silver (two-thirds of the whole), Peruvian bark, coca, and coffee, caoutchouc, alpaca wool, chinchilla skins, copper, tin, and other ores. The Roman Catholic religion is recognized as the national religion of the state, but others are permitted. Elementary education is free and nominally compulsory. There are five universities.

Bolivian history commences with the year 1825, when the republic was founded. The constitution was drawn up for the new state by General Bolívar, in whose honour the name of the state was changed to Bolivia, and was adopted by Congress in 1826. It established a legislative body composed of three chambers, with a president elected for five years.

It has since suffered different modifications, in 1826, 1831, 1863, and 1880. But since 1839 Bolivia has been almost continually distracted by internal and external troubles; and can scarcely be said to have had any definite constitution. It suffered severely in the war which, with Peru, it waged against Chile in 1879-84, and also from anarchy since.

BOLKHOFF, or **BALKHOV**, a town, Russia, capital of a district of the same name in the government and 34 miles N. of town of Orel, on the Nougra. It is a very ancient place, and is chiefly built of wood. It has manufactures of leather, glue, soap, &c., and a considerable trade in hemp, hemp-oil, and tallow. Pop. (1897), 20,703.

BOLL (from the Saxon *bolla*, a bowl), an old Scotch measure for corn, varying in different districts and for different articles. A boll of wheat or beans was equal to 4 bushels, a boll of oats to 6 bushels. The boll is still used in some parts of Scotland, but is no longer legally recognized.

BOLLANDISTS, a society of Jesuits which has published, under the title *Acta Sanctorum*, the well-known collection of the lives of the saints of the Roman Catholic Church. They received this name from John Bolland (died 1665), who edited the first five volumes from materials already accumulated by Heribert Rosweyde, a Flemish Jesuit, whose collections were intrusted to Bolland at his death in 1629. The society was first established at Antwerp. On the abolition of the society of Jesuits in 1773, it was removed to the monastery of Candenberg, in Brussels. The abolition of the monasteries by Joseph II. brought about its dissolution. A new association was formed in 1837 under the patronage of the Belgian government, and by it the publication of the great work is continued.

BOLOGNA (anciently *Bononia*), one of the oldest, largest, and richest cities of Italy, capital of the province of the same name. It lies at the foot of the Apennines, between the rivers Reno and Savena, 190 miles N.W. Rome. Bologna is 5 or 6 miles in circumference, and is surrounded by an unfortified wall of brick. It is an archbishopric, and has a tribunal of appeal in the first instance, and of commerce. It has extensive manufactures of silk goods, velvet, artificial flowers, &c. The town consists of four quarters, the older poorly, and the modern handsomely built. There are colonnades along the sides of the streets affording shade and shelter to the foot-passengers. Bologna was long renowned for its university, founded, according to tradition, by Theodorus the younger in 425, but more probably not till 1088, which, in the centuries of barbarism, spread the light of knowledge over all Europe. It once had 10,000 students, but the number is now about 1500 only. Here the famous Irnerius taught the civil law in the eleventh century, and students were attracted from every quarter. Several learned ladies have at different times been professors here, such as Laura Bassi, professor of mathematics and natural philosophy, and Matilda Tambroni, professor of Greek, and the predecessor of the famous Cardinal Mezzofanti. The university formerly possessed so much influence, that even the coins of the city bore its motto—*Bononia docet* ('Bologna teaches'). The law school enjoyed the greatest fame. Its teachers had the reputation of inculcating principles favourable to despotism, and were consequently rewarded by the favour of the emperors, and of the Italian sovereigns. Every new discovery in science and the arts found a welcome, and here Galvani discovered galvanism (1789). The medical school is celebrated for having introduced the public dissection of human bodies, and the scientific journals prove that the love of investigation is still awake in

Bologna. The university, indeed, still enjoys an excellent reputation, and is well provided with scientific collections, the anatomical collection being especially extensive. It possesses in all five faculties. The university library numbers about 170,000 volumes, with 6000 manuscripts. Since 1803 the university buildings have consisted of what was formerly the Palazzo Ceselli. The original university building now accommodates the public library, of some 200,000 volumes. The city has a picture-gallery (in the Accademia delle Belle Arte) and a museum of archaeological and other objects. In the sixteenth century the famous painters and sculptors Carracci, Guido Reni, Domenichino, and Albani founded a school, to which their works have given great reputation. (See PAINTING.) There were, even as early as the twelfth and thirteenth centuries, great painters in Bologna. Francesco Francia was famous in the fifteenth and early part of the sixteenth century. The city picture-gallery is rich in the works of these and other artists, the gem of the whole being Raphael's St. Cecilia.

The chief square of the city, Piazza Vittorio Emanuele, formerly the Piazza Maggiore, with the Piazza del Nettuno at right angles, is adorned by several venerable buildings; among them are the Palazzo Comunale (or Del Governo), which contains some magnificent halls, adorned with statues and paintings, Palazzo del Podestà (dating from 1201), now the town-hall, chiefly remarkable as having been the prison of Enzius, king of Sardinia, and son of the emperor Frederick II., who was captured and kept here by the Bolognese for more than twenty years, till his death; and the church or basilica of St. Petronio, with its unfinished front and the meridian of Cassini drawn upon a copper plate in the floor. Among the hundred other churches, the following are distinguished: S. Pietro (the cathedral), S. Salvatore, S. Domenico (containing the tomb of the saint), S. Giovanni in Monte, S. Giacomo Maggiore, all possessed of rich treasures of art, and S. Stephano, consisting of seven different churches, and partly dating from the tenth century. The palaces are numerous, and were formerly enriched with numerous and valuable works of art. Many of these have now disappeared, though frescoes and other internal decorations still remain. The admired fountain of the Piazza del Nettuno is adorned with a Neptune in bronze, by John of Bologna; in the Piazza Vittorio Emanuele is an equestrian statue of Victor Emanuel II. The leaning towers, Degli Asinelli and Garisenda, dating from the twelfth century, are among the most remarkable objects in Bologna. The former is square and of massive brick-work, built in three portions, and diminishing in diameter to the top. Its height is 321 feet, and its inclination from the perpendicular 4 feet. The Garisenda is 163 feet high, and inclines about 10 feet. Bologna is famous for macaroni, sausages, liqueurs, and preserved fruits. The pilgrimage to the Madonna di S. Luca, whose church is situated at the foot of the Apennines, three miles distant from Bologna, and to which an arcade of 640 arches leads, annually attracts a great number of people from all parts of Italy. This and other places in the environs may be reached by steam railway.

Bologna was founded by the Etruscans under the name of *Felsina*, before the foundation of Rome. In 189 B.C. it was made a Roman colony, and called *Bononia*. On the fall of the Roman Empire, it was taken by the Longobards, then it passed into the hands of the Franks, and was made a free city by Charlemagne. In the twelfth and thirteenth centuries it was one of the most flourishing of the Italian republics; but the feuds between the different parties

of the nobles disturbed the stable government of the city, and led to its submission to the papal see, and incorporation in the States of the Church, in 1506. Several attempts were made to throw off the papal yoke, one of which, in 1831, was for a time successful. In 1849 the Austrians obtained possession of Bologna, and made it the head-quarters of their 2nd Italian Corps. In 1880 Bologna was by popular vote annexed to the dominions of King Victor Emanuel. Pop. in 1899, 158,975.

BOLOGNA PHIAL, a small flask of unannealed glass, which flies into pieces when its surface is scratched by a hard body. It is prepared by the glass-maker as a test of the condition of a pot of metal before he fashions it into bottles or glasses.

BOLOGNA STONE. See BARTTA.

BOLSEC, JÉRÔME HERME, French writer, born early in the sixteenth century, died at Lyons, 1585, became first, it is said, a monk, but subsequently embraced the doctrines of the Reformation and became a medical practitioner. After retiring to Italy, and remaining for some time at Ferrara, he repaired to Geneva, and insinuated himself into the good graces of Calvin. A quarrel afterwards took place, occasioned, it is said, by the opposition of Bolsec to the doctrine of absolute election. It issued in his imprisonment and ultimate banishment from Geneva. He was driven later on also from Lausanne through the influence of Beza. He latterly returned to France, and having formally abjured Protestantism, settled as a physician in Lyons. He acquired considerable notoriety by the violence of his philippics against Calvin and Beza, in which, under the name of their lives, he has raked together and published all sorts of scandal. This at least is the common view of Protestant writers, but Catholics have often quoted Bolsec in religious controversy.

BOLSENA (ancient *Vulsinii*, one of the twelve Etruscan cities), a town in Italy, 60 miles N.W. of Rome. The town stands on the north side of the lake of the same name. It is rich in remains of antiquity, and has a church, founded in the eleventh century, with some interesting monuments, &c. Pop. 3000.—The lake (ancient *Lacus Vulsiniensis*) is about 9 miles long, and about 7 miles broad, 285 feet deep at the deepest part, 1000 feet above the level of the sea, and well stocked with fish. It is surrounded by wooded hills, affords some charming scenery, but its shores are unhealthy. It contains two small islands.

BOLSWARD, a town of Holland, in the province of Friesland, 15 miles S.W. of Leeuwarden, at the junction of several canals, and intersected by canals crossed by numerous bridges. The parish church is said to be the largest and finest in Friesland. The trade of Bolsward consists chiefly in cattle, cheese, and butter. Pop. (1899), 6422.

BOLTON, or BOLTON-LE-MOORS, a manufacturing town, and municipal, county, and parliamentary borough, of Lancashire, England. It lies 10 miles N.W. from Manchester, and consists mainly of two divisions, Great Bolton and Little Bolton, separated from each other by the river Croal. The older portion of the two contains many narrow and irregular streets, but by far the larger portion of the town is modern. About £500,000 has been recently expended in street improvements. The finest of the public edifices is the town-hall, in the Grecian style, with a tower 220 feet high, fronting a spacious square, and erected at an expense of about £200,000. Among other public buildings are one of the finest market-halls in England, costing with its approaches nearly £100,000; a church institute; a temperance hall; commodious baths, with public rooms for con-

certs, &c.; savings-bank; two theatres; two technical schools; a post-office, gas offices, county court, infirmary and children's hospital, Eden Orphanage, Chadwick Orphanage, Chadwick and Mere Hall Museums, board schools; poor-law offices, &c. The religious edifices are numerous, and some of them of fine architectural appearance. Foremost among these is St. Peter's Parish Church, a modern building in the decorated style, embracing a nave with north and south aisles and transepts, a chancel with an aisle on the south and an organ chapel on the north, and a tower at the western end 150 feet high. The other churches most worthy of notice are Holy Trinity Church, a fine specimen of the early English style; St. Paul's, Deanogate, in the early geometric style; St. James', style early decorated Gothic; and St. Stephen and All Martyrs', an elegant and ornamental building of terra-cotta. All Souls' and St. Matthew's may also be mentioned. The borough contains numerous chapels for Roman Catholics, Methodists, Baptists, Presbyterians, Friends, Unitarians, &c. The schools are numerous and well attended, and, under the school-board, education is rapidly improving. There is a free grammar-school, founded in 1641, with thirty-six foundation scholars and two university exhibitions of £80 a year each. The Bolton Free Public Libraries (six in number) contain over 93,000 vols. There are now four parks and three recreation grounds belonging to the town. In manufacturing industry Bolton is surpassed by few places in the kingdom, the cotton manufacture being its staple. It contains some of the largest and finest cotton-mills in the world. In the town itself there are some 370 factories, of which nearly 110 are cotton-mills and establishments for the weaving of cotton fabrics. In 1891 the number of hands returned as being engaged in the manufacture of cotton in the town of Bolton was 23,564, nearly 14,000 being females, besides over 1400 engaged in calico printing, &c. The yarns spun in Bolton are generally fine, and a great variety of fancy goods are produced, besides plain calicoes. Bleaching is also carried on to a great extent, there being over twenty bleaching grounds, some of them very large. There are also several large engineering works, employing a great many hands. Besides these there are collieries, paper-mills, foundries, chemical works, and various other works. Bolton is of considerable antiquity, having been raised to the dignity of a market-town in 1256. It returns two members to Parliament. Pop. of mun. bor. in 1881, 105,414; of parl. bor., 108,963; in 1891, 115,002 and 118,730 respectively; in 1901, 168,205 and 130,602.

BOMARSUND, a Russian fortress on the Åland Islands (which see) at the entrance to the Gulf of Bothnia. It capitulated to the French and English during the Crimean war, and was then destroyed. Under the treaty of Paris Russia agreed not to restore this fortress.

BOMB, a hollow, cast-iron ball or shell, filled with gunpowder or other combustible, and exploded by means of a time-fuse, being commonly thrown from a mortar. Instead of spherical bombs, elongated shells fired from rifled guns are now in general use. See **SHELL**, **MORTAR**.

BOMBARDIER BEETLE, the name given to a number of coleopterous insects belonging to the genera *Brachinus* and *Aptinus*, and to the family Carabidae. They derive their name from the remarkable power they possess of being able to expel from the anus, with a pretty loud report, a pungent, acrid fluid, which evaporates immediately on being discharged, and serves as a means of defence against their enemies. Five or six species of the genus are found in Britain, the most common of which is the

B. crepitans. It is rather less than $\frac{1}{2}$ inch long, has greenish or blue-black wing-cases; head, thorax, and legs yellowish red; and is often found under stones. The Aptini differ from the Brachini chiefly in not having wings.

BOMBAX. See **SILK-COTTON TREE**.

BOMBAY, a government or presidency of British India, consisting mainly of a strip of territory of variable breadth, stretching along the west side of the peninsula, and bounded on the land side by Baluchistan, the Punjab, Rajputana, native states of the Central India Agency, the Central Provinces, Berar, Haidarabad, Madras, and Mysore; and on the west by the Arabian Sea. It is divided into five divisions, besides Bombay city and island and the territory of Aden in Arabia. The divisions are: Sind, the least populous, Gujarat, the most populous, Deccan, Konkan, and Karnatik. The presidency also includes many feudatory states. Baroda, though geographically part of Bombay, is now in direct dependence on the government of India. The chief towns are Bombay, Poona, Ahmedabad, Surat, and Karachi. The chief spoken languages are Marathi, used by nearly half the population, Gujarathi, used by the commercial classes, Kanarese, and Sindhi. About three-fourths of the population profess Hinduism, fully one-sixth are Mohammedans, the rest being Jains, Christians, Sikhs, Parsees, aboriginals, &c.

The chief openings in the coast of Bombay are the Gulfs of Cambay and Cutch, which are separated by the peninsula of Kathiawar. The chief harbours are those of Bombay and Karachi. The river Nerbudda, which enters the Gulf of Cambay, divides the province into two physically distinct parts. North of it are Gujarat and Sind, with the peninsulas of Cutch and Kathiawar, mostly a fertile alluvial plain. Much of Sind, however, is a desert crossed by low sand-hills. South of the Nerbudda, the province presents a narrow flat strip of coast, rising inland towards the upland country of the Western Ghats and the Deccan. Basaltic rocks predominate here, and by their decomposition have produced the rich black cotton soil. The chief mountain ranges are the Hala mountains, west of the Indus, the Western Ghats, running north and south, and the Satpura range, running east and west, separating the basins of the Nerbudda and the Taptee. The most important rivers are the Indus, Nerbudda, and Taptee, all of which flow into the Arabian Sea; the Godavari and Kistna rise on the eastern slopes of the Ghats. Many short torrential rivers traverse the Konkan coastal strip. The Raun of Cutch is a notable natural feature. The forests of Sind consist chiefly of sisu, babul (a kind of acacia), bhan (a species of poplar), and tamarisk; but of far greater importance are the splendid forests of the western slopes of the Ghats, where the rainfall is excessive. From these are obtained teak, blackwood, ebony, ironwood, babul, sandalwood, and other valuable timbers. The coco-nut and date palms, mango, jack, betel-nut, and myrobalans are other important indigenous vegetable products. Among the wild animals are the maneless lion of Gujarat, the wild ass, leopard, tiger, black bear, bison, antelope, and venomous snakes. The province possesses little mineral wealth, but iron, copper, lead, and sulphur have been found. Limestone, building-stone, and slate are quarried. The climate varies greatly from one district to another, two extremes being represented by Upper Sind, with great heat and little rain, and the Konkan, with excessive rainfall, especially from June to October. Irrigation is extensively practised in Sind, but not much in Bombay proper. The chief agricultural productions are cotton,

rice, millet, wheat, barley, dates, the cocoa-palm, oil-seeds, sugar, and indigo. The area of the presidency under British administration is 124,122 square miles, which includes 76,108 belonging to Bombay proper, and 48,014 to Sindh. The area of the native states belonging to the presidency is 89,046 square miles. Population of Bombay proper in 1891, 15,957,489; of Sindh, 2,871,774; of the whole presidency, 18,873,342; in 1901, 16,880,466, 3,212,808, and 18,584,496. In 1899-1900 the imports of merchandise and treasure were £30,202,818, and the exports £29,344,569. The growth of cotton in Bombay received a great impetus during the American war; and though that state of matters did not prove lasting, cotton continues to be a highly important crop, part of the produce being exported, and a considerable portion of it worked up in the cotton-mills of Bombay. Of these there are now about 90 at work. The total number of pupils receiving education at primary and other schools amounts to about 750,000, of whom only about one-eighth consist of females. The annual revenue largely exceeds the expenditure, and latterly has amounted to about £16,000,000.

BOMBAY, a city and seaport on the west coast of India, capital of the presidency of the same name, situated at the southern extremity of the island of the same name, and connected with the mainland and the interior by extensions of the Bombay and Baroda, and the Great Indian and Peninsula Railways, the terminus of the latter being a splendid edifice which cost £300,000. Extensive water-works have been constructed on the mainland, including a dam 2 miles in length, and were opened in 1892. The town comprises two main portions, one known as the Fort, and formerly surrounded with fortifications, on a narrow point of land with the harbour on the east side and Back Bay on the west; the other known as the City, a little to the north-west. The European population live partly in the Fort quarter, but mostly in villas surrounded with extensive areas, called compounds, in various parts of the island. Bombay has many handsome buildings, both public and private, and a number of fine streets, the latter being in many cases traversed by tramways. The castle, the government offices, and almost all the merchants' warehouses and offices are in the Fort. On the esplanade facing south-west is a fine range of public buildings, including the secretariat, the new high court, the offices of the public works department, the post and telegraph offices, &c. There are a cathedral and several other churches in Bombay, which is the see of an Anglican bishop. There are also some fine hotels. In 1859 a university was opened. Various industries, such as dyeing, tanning, and metal working, are actively carried on, and there are now a number of large cotton-mills. The commerce of the port is very extensive, by far the greater portion of the exports and imports of the presidency passing through Bombay. The chief article of export is raw cotton, the chief import cotton piece goods, the commerce being chiefly with Britain. The total value of exports and imports together amounts to over £60,000,000 annually. The harbour is one of the largest and deepest in India; while its scenery and that of the neighbouring continent presents a rare combination of grandeur and beauty. It is 12 or 14 miles long, and from 4 to 6 wide. It is situated between the islands of Colabah, Bombay, and Salsette on the one hand, and the mainland and islands of Caranjah and Elephanta on the other. There are large and commodious docks, the ships and basins being calculated for vessels of any size. There is a large traffic with steam vessels between Bombay and Great Britain, and regular steam communication with China, Australia, Singapore, Mauri-

tius, &c. A railway between Bombay and Tannah, on the island of Salsette, 20 miles distant, opened in 1853, was the first Indian railway constructed. Pop. in 1901, 770,843.—The island of Bombay is about 11 miles long from N. to S., and about 8 miles broad, formed by two ranges of rock running parallel to each other on opposite sides of the island. The interior was formerly liable to be overflowed by the sea, to prevent which substantial walls and embankments were constructed, but the lower parts are still covered with water during the rainy monsoon.

Bombay was obtained by the Portuguese in 1530 from an Indian chief at Salsette; by them it was ceded to Great Britain in 1661, and in 1688 it was transferred to the East India Company. Next to Madras it is the oldest of the British possessions in the East. From the commencement of the last century it has gradually increased in importance, and has now attained a remarkable degree of prosperity.

BOMBAZINE, derived from *bombayz*, the Greek term for silk and silkworm, is a mixed tissue of silk and worsted, and was long woven both plain and coloured. The latter, however, has gone into disuse, and the only colour now used is black, for which there is an extensive demand, both at home, where it is the female mourning dress, and abroad, especially in Spain and South America, where some of the religious orders use it, and it generally forms the material of the almost universally-worn Spanish *mantilla*. The manufacture was originally introduced into England by a colony of Dutch or Flemings, who settled in Norfolk, and long continued to have its principal seat at Norwich, the capital of that county, though it is now chiefly confined to Halifax and Kidderminster.

BOMB-KETCH, a name applied to a kind of vessel which was formerly built for the use of mortars at sea, and furnished with all the apparatus necessary for a vigorous bombardment. Bomb-ketches were built remarkably strong, to sustain the violent shock produced by the discharge of the mortars. They generally carried two 10-inch mortars, four 68-pounders, and six 18-pound carronades. A bomb-ketch was generally from 60 to 70 feet long from stem to stern, drew 8 or 9 feet of water, carried two masts, and was usually of 100 to 150 tons burden. It was generally attended by a brig as tender, on board of which the party of artillery remained till their services were required on board the bomb-vessels.

BONA (the *Aphrodisium* of Ptolemy), a seaport of Algeria, prov. of and 86 miles N.N.E. Constantine; lon. 7° 36' E.; lat. 36° 32' N. Pop. (1891), 80,806, among whom there are about 10,000 French and as many foreigners. It is built at the foot of a hill, and is surrounded by a wall nearly 2 miles in circumference. It is the seat of French judicial courts. The streets are narrow and crooked, but many of the houses are substantial and well built, and the town has been greatly improved since it came into the hands of the French in 1832. It possesses a college, schools, a fine Catholic church, a convent of the Sisters of Mercy, an hospital, &c. There is a good market, and also reading-rooms, coffee-houses, and a theatre. The chief manufactures are burmooses, tapistry, and saddles. It exports corn, iron ore, alfalfa, wine, wool, hides, wax, oil, honey, &c.; and its trade is considerable. There is regular steamboat communication between Bona and Marseilles. About 1 mile S. of the town are the remains of Hippo Regius.

BONA DEA, a name given by the Latins to Fauna or Fatua. She was so chaste that no man saw her after her marriage but her husband, for which reason her festivals were celebrated by night.

in private houses, and all statues of men were veiled during the ceremony. By the Greeks the Bona Dea was identified with Hecate, Semele, or other divinities.

BONA FIDES, BONA FIDE, a term derived from the Roman jurists, and frequently occurring in connection with Scottish legal matters, but scarcely holding a place in English law. It means of course 'good faith,' or 'with good faith,' and implies the absence of all fraud or unfair dealing, being therefore opposed to *mala fides* or *dolus* (bad faith or deceit). In the law of Scotland a *bona fide* possessor is a person who holds property upon a title which he honestly believes to be good. When such a person has been evicted by one who can prove a better title, he is entitled to retain what profits he has derived from the property during his period of possession. *Bona fides* ends when the possessor becomes aware of the insufficiency of his title, but this is naturally a point which there is generally considerable difficulty in fixing. The term '*bona fide* traveller' frequently crops up in Scotland in cases coming under the Forbes Mackenzie Act.

BONAPARTE, or **BUONAPARTE**, the name of a Corsican family—a name now as well known as any in history. Several families are mentioned as early as the twelfth century who bore the name of Bonaparte, and who took a position of some prominence in the history of Italy. In 1122, for instance, a Bonaparte was banished from Florence as a Ghibelline. Corrado Bonaparte is mentioned in 1170 and Jacopo Bonaparte in 1210 as knights of the order of the Golden Spur. The office of *podestà* was held by Nordin Bonaparte in Parma in 1272, by Pietro Bonaparte in Padua 1285, and by Giovanni Bonaparte in Florence 1333. In 1250 a Bonaparte was syndico of Ascoli, and in 1440 Cesare Bonaparte was chosen as head of naval affairs at Savona. A Giovanni Bonaparte is said to have married a niece of Pope Nicholas V in 1404, but this seems doubtful for chronological reasons. It is however certain that about 1454 Nicolo Bonaparte was ambassador of this pope to several courts, and vicar of the Holy See in Ascoli. Another Nicolo Bonaparte, professor at San Miniato in the sixteenth century, is stated to have been the author of the comedy *La Vedova* (Florence, 1668); and a work on the Sack of Rome in 1527 is attributed to the Tuscan Giacomo or Jacopo Bonaparte, who was an eye-witness of the event. The connection between these different Bonapartes is by no means well established; yet in 1771 the relationship of the Corsican Bonapartes with the Florentine Bonapartes was judicially recognized. In Corsica itself a Messire Bonaparte appears as witness to an act executed by Berengar II. of Italy as early as 947, and it is therefore not improbable that the family originally emigrated from this island to the mainland, and that a branch of the Genovese line returned to their old home in the sixteenth century. From the time of Gabriel Bonaparte, who settled at Ajaccio in 1567, and took part in the naval expeditions against the Moors, the Bonapartes ranked as a patrician family of that town. In 1578 Girolamo Bonaparte was elected deputy of Ajaccio in the senate of Genoa, and in 1614 Francesco was chosen captain of his native town. About the middle of the eighteenth century there remained three male representatives of the family of Bonaparte at Ajaccio, viz. the archdeacon Luciano Bonaparte, his brother Napoleone, and the nephew of both, Carlo, son of Giuseppe. Carlo, or Charles Bonaparte, born 29th March, 1746, was destined by fate to be the father of the Emperor Napoleon I. and of a numerous family of princes. He was carefully educated, studied law at Pisa, and soon after his return married without the consent of

his relatives Letizia Ramolino, a beautiful patrician. He fought under Paoli for the independence of Corsica, but resistance to the French proving useless he went over to their side. In 1771, when Louis XV. caused 400 Corsican families to be selected who alone were to be considered noble, the Bonaparte family—and consequently Charles—was among the number. By the influence of the French governor Marbeuf, who was very friendly towards the family, he was (1773) named royal councillor and assessor for the town and province of Ajaccio. As a member of the deputation of Corsican nobles sent to the court of France in 1777 he resided several years at Paris, and was fortunate enough to secure a free admission for his eldest son Joseph to the seminary at Autun, another for his second son Napoleon to the military school of Brienne, and a third for his daughter Maria Anna to the educational institution at St. Cyr. He returned to Corsica in 1779, and afterwards went to Montpellier, where he died, 24th Feb. 1785. By his marriage with Letizia Ramolino he left eight children: Giuseppe, or Joseph (see below), king of Spain, Napoleon I., emperor of the French (see NAPOLEON I.); Lucien (see below), prince of Canino; Maria Anna, afterwards called Elise, princess of Lucca and Florence, and wife of Prince Bacciocchi (see BACCIOCHI); Luigi, or Louis (see below), king of Holland; Carlotta, afterwards named Marie Pauline, princess Borghese (see BORGHESI); Annunziata, afterwards called Caroline, wife of Murat (see MURAT), king of Naples; and Girolamo, or Jerome (see below), king of Westphalia. See also **BONAPARTE (LETITIA RAMOLINO)**.

BONAPARTE, JEROME, youngest brother of Napoleon, was born at Ajaccio in Corsica on 16th November, 1784, and at an early age entered the French navy as a midshipman. In 1801 he was sent out on an expedition to the West Indies, but the vessel being chased by English cruisers, was obliged to put in to New York. During his sojourn in America, Jerome Bonaparte became acquainted with Miss Elizabeth Patterson, the daughter of the president of the Bank of Baltimore, and a descendant, as is asserted, of 'Old Mortality,' immortalized by Sir Walter Scott. His addresses to this young lady having been accepted, they were duly married on 21th December, 1803, according to the Roman Catholic ritual, in the cathedral of Baltimore, and in 1805 embarked for Europe. This marriage of his brother did not meet the approval of the Emperor Napoleon, whose ambitious views it thwarted, and he accordingly, after an ineffectual application to Pope Pius VII. to have it dissolved, issued a decree declaring it to be null and void. On 12th August, 1807, Jerome was married to Catherine Sophia, princess of Wurtemberg, and in a few months afterwards was created King of Westphalia, and crowned with great pomp at Cassel on 1st January, 1808. His government was not marked by much judiciousness or prudence; little regard was paid to national feelings, and the finances of the state, both from mismanagement and the frequency of hostile incursions, became ere long involved in hopeless embarrassment. The battle of Leipzig put an end to Jerome's reign, and he was obliged to take flight to Paris. On the conclusion of the treaty of Paris he left France, and proceeded first to Switzerland, thence to Gratz, and in the beginning of 1815 to Trieste. On his brother's return from Elba he again proceeded to Paris, and was nominated a peer of France. At the battles of Ligny and Waterloo he was actively engaged, and displayed considerable bravery, besides receiving a wound in the arm. On Napoleon's overthrow he retired first to Switzerland, then to Wurtemberg, and from this period up to the fall of Louis

Philippe in 1843, resided in different parts of Europe under the title of the Comte de Montfort, and latterly chiefly in Florence. On the outbreak of the revolution of February in the year last mentioned, he returned to Paris, and was appointed on 23d December governor-general of the hospital of the Invalids, and in 1850 a marshal of France. In 1852 he was made president of the senate. He died after a lingering illness at his seat of Villagenis, near Paris, on 24th June, 1860.

Reference has already been made to the two successive marriages contracted by Jerome Bonaparte. From his union with Miss Patterson only one son proceeded, Jerome, who was brought up among his maternal relations in America, and married a lady of that country, by whom he had a son, who served as an officer in the French army during the Crimean war. From Jerome Bonaparte's second marriage with the Princess of Württemberg sprung two children, Prince Napoleon Joseph and the Princess Mathilda. A process before the civil tribunals of France in reference to these marriages excited considerable interest. The unaltered stability of the first marriage had all along been maintained by Madame Bonaparte (Miss Patterson), and on the death of Jerome, her son, M. Jerome Napoleon Bonaparte, lodged a claim to a share with the offspring of the second marriage in the property left by his father, founding on the title of his legitimacy; but after a trial in France judgment was given against him. Prince Napoleon Joseph married Clotilde, daughter of King Victor Emmanuel of Italy, and their son Victor (born 1862), since the death of Napoleon III.'s son, the Prince Imperial, is generally recognized by the Bonapartists as the heir to the traditions of the dynasty.

BONAPARTE, JOSEPH, the eldest brother of Napoleon, was born at Corsica in 1768, educated in France at the college of Autun, returned to Corsica in 1785, on his father's death, studied law, and in 1792 became a member of the new administration of Corsica under Paoli. In 1793, after Paoli had called in English aid, he emigrated to Marseilles, and became brother-in-law to Bernadotte, afterwards king of Sweden, by marrying one of the daughters of a wealthy banker named Clari. In 1798 he accompanied the army of Italy as commissary, in 1797 was elected a Corsican deputy to the Council of Five Hundred, and shortly after was sent by the Directory ambassador to the pope. He returned abruptly, and had not long resumed his seat in the Council of Five Hundred, when his brother having become first consul he was made councillor of state, and employed to negotiate a treaty with the United States. Shortly after, in 1801, he negotiated the peace of Lunéville with the Emperor of Germany, and in 1802 that of Amiens with Great Britain. Napoleon having now begun to deal out kingdoms among his family, Joseph was made King of Naples and Sicily in 1806, but had only reigned two years when his brother recalled him, and sent him to Madrid to be King of Spain and the Indies. His seat at Naples had not been comfortable, and he now found himself on a bed of thorns. His kingship lasted nominally for five years, but he was chased once and again from his capital, and the third time, in 1813, fled not to return. In these appointments Joseph was merely a tool in his brother's hands. In 1814, after the fatal expedition to Russia, Napoleon on setting out for the army made him lieutenant-general of the empire, and head of the council of regency. This was his last office of any consequence. After the battle of Waterloo he sailed for the United States, purchased an estate on the banks of the Delaware near Philadelphia, and there fixed his residence, assuming the title of Count de Survilliers, and living in considerable style. On

the revolution of 1830 he addressed a letter to the chambers putting in a claim for Napoleon's son. Shortly after he came to England, and after residing for some time repaired to Italy, and died at Florence in 1844, leaving property which has been estimated at more than £500,000.

BONAPARTE, LETIZIA RAMOLINO, the mother of Napoleon, and hence known by the name of *Madame Mère*, was born at Ajaccio in Corsica in 1750, and was married in 1767 to Charles Bonaparte, a lawyer and small proprietor, who fought under Paoli for the independence of his native island against the French. She was left a widow in 1785, and continued to reside in Corsica till her son became first consul, when she fixed her residence at Paris, had a separate establishment assigned to her, and lived in considerable state, though somewhat retired. All things considered, she conducted herself with great discretion, performing her part becomingly in the station to which she had been so unexpectedly elevated, and yet never allowing herself to forget that in the necessary course of events the sudden rise of her family might one day be terminated by an equally sudden fall. When the fall came she retired to Rome, and collecting most of the surviving members of her family around her, lived to the very advanced age of eighty-six, dying in 1836.

BONAPARTE, LOUIS, Count of St. Leu, second younger brother of the Emperor Napoleon I., and father of Napoleon III., the late Emperor of the French, was born in Corsica, 2d September, 1778. He was educated in the artillery school at Chalons, accompanied Napoleon to Italy, and afterwards to Egypt, but without distinguishing himself in any special manner. He subsequently rose to the rank of a brigadier-general, and in 1802 married Hortense Eugénie Beauharnais, Napoleon's step-daughter. In 1806, on Schimmelpenninck, grand pensionary of Holland, demitting his office, Louis Bonaparte was compelled by his brother, notwithstanding his protestations, to accept the Dutch crown. The difficult situation in which he was placed rendered it impossible for him to be anything else than a mere viceroy of Napoleon; but to his credit it must be recorded that he exerted himself to the utmost in promoting the welfare of his new subjects, and resisted as far as in him lay the tyrannical interference and arbitrary procedure of France. With all his efforts, however, he found himself unable to restore the finances of the country to a healthy condition: a quarrel took place between him and his brother relative to the continental system maintained by the latter, which had proved most injurious to Dutch commerce, and he ultimately, on 1st June, 1810, abdicated the sovereignty, and retired to Gratz under the title of the Count of St. Leu. Holland was thereupon annexed to France. In 1814 Louis paid a visit to Paris, and strongly counselled his brother to make peace with the allies. After the restoration he took up his abode at Rome, and separated himself from his wife Hortense, a disunion which continued throughout his life. In 1826 he removed from Rome to Florence, and from thence, a short time after his son's escape from the fortress of Ham, to Leghorn, where he died on 25th July, 1846. His literary abilities were considerable, and he was the author of a novel entitled *Marie, les Peines de l'Amour ou les Hollandaises*, and *Documents historiques et Réflexions sur le Gouvernement de la Hollande*, par Louis Bonaparte, ex-roi de Hollande; besides other works.

BONAPARTE, LUCIEN, Prince of Canino, next younger brother of Napoleon, born at Ajaccio in 1775, emigrated to Marseilles in 1793, and made himself conspicuous as a hot-headed republican by speechifying at clubs, and publishing bombastic pam-

phlets. Shortly after, having been appointed to a situation in the commissariat at the small town of St. Maximin in Provence, he married the innkeeper's daughter. He made a narrow escape during the Reign of Terror, and in 1796 was appointed commissary at war, and next, on his election as a member of the Council of Five Hundred, took up his residence in Paris. He joined the opposition in the council, and seconded Sieyès and his party, who wished to frame a new constitution. He is said to have written to his brother in Egypt complaining of the incapacity of the executive Directory, and urging his return; and in 1799, when the council wished to outlaw Napoleon, Lucien, who was president, after manfully resisting the motion, slipped quietly out of the chair in the confusion, and sent in the soldiers, who cleared the hall. The revolution thus mainly accomplished by his decisive procedure led to the establishment of the consular government, and Lucien was member of the commission which framed its constitution. He was now appointed minister of the interior, but very shortly afterwards he quarrelled with his brother, and was sent ambassador to Spain. Here he succeeded, by ingratiating himself with Charles IV. and Godoy, in re-establishing French ascendancy, and preparing the way for the series of intrigues in which the character of Napoleon appears in its most unfavourable light. On his return to Paris in 1802 he was member of the tribunate, and then a senator, and having lost his first wife, married a stockbroker's widow. This marriage, and probably other concurring causes, appear to have given deep offence to Napoleon, and in the enactment fixing the succession to the crown, while Joseph and Louis were named eventual heirs, Lucien and Jerome were not mentioned. Lucien now fixed his residence at Rome, where he appears to have gained the good graces of Pius VII., who created him in 1814 Prince of Canino. During Napoleon's haughty treatment of the pope, Lucien had freely expressed his displeasure, and apparently despairing of a reconciliation with his brother, or perhaps not caring to ask it, he embarked for the United States in 1810, but had not proceeded far when he was captured by a British cruiser and carried to Malta. Ultimately he was brought to England, and allowed to reside on parole at a place in the vicinity of Ludlow Castle. Here he employed much of his time in writing a poem entitled *Charlemagne on l'Eglise Sauvée*, which he afterwards published with a dedication to Pius VII. After the battle of Waterloo his brother appointed him his extraordinary commissioner to the chamber of deputies. He showed no lack of zeal in endeavouring to arouse a feeling of sympathy, but found the attempt vain, and left matters to take their course. He afterwards returned to Italy, and died at Rome on June 29th, 1840. Besides the poem *Charlemagne*, which has been translated into English, and published in two vols. 4to, he wrote another, called *La Cyméide ou la Corse Sauvée*, and an autobiography, which, under the title of *Mémoires*, was published in London in 1836, and of course during his lifetime.

—His eldest son, CHARLES LUCIEN JULES LAURENT BONAPARTE, Prince of Canino and Musignano, was born at Paris on May 24th, 1803, and achieved a considerable reputation as a naturalist, chiefly in ornithology. He published a continuation of Wilson's *Ornithology of America* (1826-33); the *Iconografia della Fauna Italiana* (1832-41), his *chef d'œuvre*; *Catalogo Metodico degli Uccelli Europei* (1842); *Catalogo Metodico dei Pesci Europei* (1846); *Ornithologie Possible* (1858); and a number of other valuable works on zoology, and was a member of the leading natural history societies in Europe and America. During the later years of his life he took a prominent part in Italian affairs as a supporter of the liberal party. He

died on 29th July, 1857.—Another son, LOUIS LUCIEN, (1818-81), gained distinction in comparative philology. He lived in England for many years after 1870.

BONAVENTURE, Sr., properly John of Fidanza, one of the most renowned scholastic philosophers, was born in 1221 in Tuscany, became in 1243 (or 1248) a Franciscan monk; in 1253 teacher of theology at Paris, where he had studied; in 1256 general of his order, which he ruled with a prudent mixture of gentleness and firmness. He died in 1274 at the age of fifty-three. At this time he was a cardinal and papal legate at the Council of Lyons. His death was hastened by his ascetic severities. On account of his blameless conduct from his earliest youth, and of some miracles ascribed to him, he enjoyed during his life the greatest veneration, and was canonized by Pope Sixtus IV. The elevation of thought in his writings procured him the name *Doctor Seraphicus*. The Franciscans oppose him as their hero to the Dominican scholastic Thomas Aquinas. He wrote for the honour and improvement of his order, for the promotion of the worship of the Virgin, on celibacy, transubstantiation, and other doctrines. He is, on the whole, distinguished from other scholastics by perspicuity, avoidance of useless subtleties, and greater warmth of religious feeling. Among his writings are *Itinerarium Mentis in Deum*; *Reductio Artium in Theologiam*; *Centiloquium*; and *Breviloquium*. His whole works were published 1588-96, at Rome, seven vols. folio; and there are several modern editions. But many pieces attributed to him are not genuine.

BOND, a deed or instrument of obligation in writing, whereby one person (or more) becomes bound to another or others to pay a sum of money, to abide by an award, or to do some lawful act, or not to do some particular thing or things specified in the condition of the bond. The person who gives the bond and so binds himself to do something is called the *obligor*, the person receiving the bond is called the *obligee*. If there is no stipulation in the bond that the obligor shall suffer any penalty in case of non-performance, the bond is called a simple one. But there is generally a condition added that if the obligor does some particular act, the obligation shall be void, or else shall remain in full force, as payment of rent, performance of covenants in a deed, or repayment of a principal sum of money borrowed of the obligee, with interest; which principal sum is usually one half of the penal sum specified in the bond. In case this condition is not performed the bond becomes forfeited or absolute at law, and charges the obligor while living, and after his death his personal representatives and his heirs, if the heirs be named in the bond. In case of a failure to perform the condition, the obligee can recover only his principal, interest, and expenses; if the bond were given to secure the payment of money, or to secure the performance of a covenant, he can recover only reasonable damages for the breach. A bond stipulating either to do something which is either wrong in itself, or forbidden by law whether wrong in itself or not, or to omit the doing of something which is a duty, or to encourage such crimes and omissions, is void. Bonds to procure marriage (or marriage brokerage bonds) or to restrain marriage, or for immoral considerations, such as future (but not past) cohabitation, and also in total but not partial restraint of trade, are void. No person who cannot legally enter into a contract can become an obligor, though such a person may become an obligee. An infant, or a lunatic, therefore, though they cannot grant a bond, may have bonds granted them, by which the obligor must abide. A woman married after 1st January, 1883, can grant a bond in so far as it is connected with her own separate estate. No

particular form of words is essential to the validity of a bond; but it must be stamped and sealed. In Scotland bonds differ somewhat in form from those drawn up in England, and they do not require to be sealed.

BONDAGE. See **VILLENAGE**.

BONDI, CLEMENT, one of the most popular poets of modern Italy, was born in 1742 at Mizzano, in the duchy of Parma, became Jesuit shortly before the suppression of the order, and was appointed professor of eloquence in the University of Parma. He afterwards provoked the hostility of the order by publishing an ode in praise of their suppression, and was obliged to seek an asylum in the Tyrol, where the Archduke Ferdinand took him under his protection, appointed him his librarian at Brunn, and intrusted him with the education of his sons, one of whom afterwards succeeded to the duchy of Modena. In 1816 Bondi was appointed professor of history and literature at Vienna, and died there in 1821. He was an easy and elegant versifier, and cultivated with success almost all the varieties of poetry—lyric, didactic, satirical, and elegiac. Among the most important are *La Giornata Villereccia*, *La Conversazione*, and *La Felicità*. He also executed a metrical version of the *Æneid*, which some consider his best work.

BONDOU, a country of West Africa, belonging to the French territory of Senegal, on the west of the Falemé, a tributary of that river. Its length is about 115 miles, its breadth about 100. Its surface is but little diversified, and the land as a whole is not very fertile, nor is the climate good. The ordinary African animals occur, but the lion is becoming scarce. The ass is the chief domestic animal. The population, which consists of Fulahs and other tribes, is rather sparse, having been reduced by frequent wars, but under French rule is beginning to increase. Agriculture, manufactures, and commerce are alike unimportant.

BONE. The bones are the hardest and most solid parts of animals; they constitute the frame, serve as points of attachment to the muscles, and afford support to the softer solids. They are the instruments, as muscles are the organs, of motion. In the mammalia, birds, fish, and reptiles, the whole system of bones united by the vertebral column is called the *skeleton*. In the fetus they are first a vascular gelatinous substance, in different points of which earthy matter is gradually deposited. This process is perceptible towards the end of the second month, and, at the time of maturity, the bone is completely formed. After birth the bones become gradually more solid, and, in the temperate zones, reach their perfection in men between the ages of fifteen and twenty. From this age till fifty they change but slightly; after that period they grow thinner, lighter, and more brittle. Those of the two first classes of animals are harder on their exterior than they are internally. Their material is nearly the same throughout. Their structure is vascular, and they are traversed by the blood-vessels and the absorbents. They are hardest at the surface, which is formed by a firm membrane called the *periosteum*; the internal parts are cellular, containing a substance called *marrow*. The use of the marrow is to prevent the too great dryness and brittleness of the bones.

Chemistry decomposes bone into gelatin, fat, cartilage, and earthy salts. A fresh bone boiled in water, or exposed to the action of an acid, gives out its gelatin; if boiled in water, on cooling the decoction a jelly is formed which makes a good portable soup. A pound of bone yields twice as much as the same quantity of flesh. The earth of bones is obtained by calcination; that is, by exposing them to

a red heat, by which they are deprived of the soft substances. It consists principally of calcic phosphate, with small quantities of magnetic phosphate, and of calcic carbonate and fluoride. Bones are now very extensively used as fertilizing agents. See **BONE MANURE**.

BONE BLACK, IVORY BLACK, or ANIMAL CHARCOAL, the black carbonaceous substance into which bones are converted by calcination or destructive distillation in close vessels, and which is extensively used in the process of sugar-refining. This application of it is due to the property which it possesses in common with other kinds of charcoal, but in a superior degree, of depriving various kinds of solutions, syrups, &c., of their colouring matters, and thus blanching or purifying them. Animal charcoal is prepared either by heating the bones in a retort similar to that in which the coal is decomposed in gas-works, or, which is the better plan, in small cast-iron pots piled up in a kiln. The pots are placed above each other with their mouths in contact, the mouths being luted together with loam. Two of the pots together hold about 50 lbs. of bones, which should previously be freed of all fatty, fleshy, and tendinous matters, as the quality of the charcoal is in this case improved. The bones lose, on the average, about half their weight in the process of calcination. The charcoal is ground between grooved rollers in order to prevent the formation of dust, and by this means it is reduced to the condition of coarse grains varying from the size of turnip-seed to that of peas. Liquids are decolorized by passing them through a filter or bed of thin granular charcoal, which absorbs by mechanical action the colouring matters held in solution. The filtering beds used in sugar-refining are sometimes of the depth of 50 feet. After the liquor has flowed for a certain time the charcoal becomes completely saturated, and its purifying action ceases. It has then to be restored so that it may be used again, and this is effected by various means, such as washing with water or with weak hydrochloric acid, long exposure to air and moisture, or heating to redness. The last is the best method, and is the one almost invariably adopted, the charcoal being heated in iron pipes, fire-clay chambers, or in rotating cylinders.

BONE MANURE. The introduction of bones as a field manure is one of the most important agricultural improvements that have been effected in modern times, and more particularly as having been the means by which turnip culture has been carried over extensive tracts of country which were previously almost valueless and unproductive. Their value as fertilizing agents arises from the fact that they furnish on decomposition large quantities of ammonia, carbonic acid, phosphorus, lime, &c., all of which are so necessary to the support and growth of plants. Both the organic and the earthy matter of which the bones consist are equally valuable. The phosphates of the earthy portion of the bones are dissolved by the action of rain-water (which always contains carbonic acid), and thus find their way into plants. The action of the air at the same time aids in the decay of the organic matter, and as a consequence of this transformation, carbonic acid and ammonia are simultaneously with the phosphates presented to the plants. A very small quantity of this rich manure, if wholly used by the plants, ought to be sufficient for the wants of a large crop—54 lbs., for instance, would supply phosphates for an acre of wheat or oats—but the mechanical structure of bones opposes their rapid decay and solution, and extends their action over a long period. The fatty substance in bones prevents the access of air and water, both of which are necessary to render them available for

plants. When they are boiled, this fat and a certain quantity of gelatin (the nitrogenous ingredient of bone) are removed. This process, by removing the ammonia-producing ingredients, rather deteriorates the value of the bones than otherwise; but by altering their mechanical structure, and rendering them more liable to be acted on by the weather, boiled bones become speedily useful, and are often preferred. Recently a better method, depending on the action of benzine, has been introduced; its advantage consists in the fact that less of the nitrogenous material is removed along with the fats. The method of reducing bones by breaking them to small pieces, or grinding them to dust, depends for its advantage on the same circumstance. The surface of the bone exposed to the action of the weather is much increased by these operations, and the decay and solution of the manure more rapidly effected. When the soil contains much organic matter, burned bones (or bone-ash) are often applied with advantage. Burned bones absorb water and air very readily, and by the combined action of these the lime phosphate is quickly dissolved; but it ought not to be forgotten that neither phosphates nor nitrogenous substances are by themselves useful, but only so when in combination, and therefore that burned bones can only be applied with advantage when other sources for the organic elements of plants are fully supplied at the same time. The fermentation, or, as it is more correctly called, the putrefaction of bones, is also intended to make them more speedily available as manure, and it has this advantage, that while both the mineral and organic matter are rendered more soluble, very little of the latter is wholly lost. An excellent species of bone manure is that known as dissolved bones, the bones being dissolved in hydrochloric or, what is much better, sulphuric acid. The earthy constituents of bones are thus rendered soluble in water, and a most important adjunct to the action of the phosphoric acid and ammonia is given in the sulphuric acid, as sulphur is an essential ingredient of the flesh-forming principles of plants.

Bones were first prepared by machinery in Yorkshire and Lincolnshire in 1814 or 1816, but the machinery was then very imperfect, and only broke the bone into pieces from the size of an egg to that of a walnut. Successive improvements have made the form or size of the pieces almost completely at the power of the crusher where the machinery is sufficiently powerful, and the manure can now be obtained in a finely divided condition, when it forms bone dust, or in a coarser state, the fragments varying from $\frac{1}{4}$ to $\frac{1}{2}$ inch in size. The fine dust holds the highest mercantile value. The extensive use of bones upon the turnip soils of England, and the high estimation they have also attained as a dressing for pasture in Cheshire and other grazing counties, and for remote uplands, has caused an extensive importation of foreign bones into Great Britain. The Argentine Republic and India send the largest quantities to the United Kingdom. The bones collected in Britain itself are generally most highly esteemed, and fetch the highest price in the market. Before being turned to the purposes of agriculture they are very often boiled for the sake of the oil or fat they contain, which is used in the manufacture of soap, and in the composition of lubricants for the axles of carts, wagons, &c.

BONER, ULBRICH, the most ancient German fabulist, was a Dominican friar at Bern, in the first half of the fourteenth century. He lived when the age of minstrelsy and ohivralous poetry was in its decline, and published a collection of fables under the title *Der Edelstein* (The Gem), which is distinguished by purity of language and picturesque

simplicity of description. The first editions of these fables were by Bodmer and Eichenburg. Benecke published a very good edition with explanatory notes and an excellent vocabulary (Berlin, 1816); that of Pfeiffer appeared at Leipzig in 1844.

BONESET, or THOROUGHWORT (*Eupatorium perfoliatum*), is a very useful annual plant of the order Compositæ, indigenous to America. It is easily distinguished in the autumn in marshy grounds by its tall stem, 4 or 5 feet in height, passing through the middle of a large double hairy leaf, and surmounted by a broad flat corymb of light purple flower-heads. In the United States it is much used as a domestic medicine in the form of an infusion of the flowers and part of the remainder of the plant in boiling water. The infusion when drunk in considerable quantity is said to break up and throw off violent colds. Smaller quantities of the infusion, in combination with other medicines, are also found highly serviceable in rheumatism and rheumatic fevers. The cold infusion has tonic properties, and is often used instead of Peruvian bark. Boneset is also one of the popular British names for the common comfrey (*Symphytum officinale*).

BONHILL, a town and parish in Dumbartonshire, Scotland. The town is beautifully situated on the E. bank of the river Leven, which is here crossed by a handsome iron girder bridge connecting Bonhill with Alexandria, about 8 miles N. of Dumbarton. The houses are generally well built; the inhabitants are chiefly employed in calico-printing, bleaching, and Turkey-red dyeworks. The family of Smollett is associated with the parish of Bonhill, a monument to Tobias Smollett, the novelist, has been erected at Renton in the neighbourhood. The pop. of the town in 1891 was 3848.

BONIFACCIO, BONIFACIO (Latin, *Bonifacium*), a seaport of Corsica, on a strait of the same name which separates Corsica from Sardinia, 45 miles S.E. from Ajaccio. It stands on a peninsula about 180 feet above the sea, is well built, and contains several handsome churches. The port is good, but difficult of access on account of its narrow entrance. Wine and oil are exported, and a coral fishery is carried on. It is exposed to hot winds from the south. Pop. (1891), 3708. The Strait of Bonifacio is 7 miles broad, and contains several small islands.

BONIFACE, the name of several popes.—BONIFACE I., elected 418 by a party of the clergy, and confirmed by the Emperor Honorius, who declared the anti-pope Eulalius a usurper. Boniface persecuted the Pelagians, and extended his authority by prudent measures. A decree of the Emperor Theodosius deprived him, in 421, of the spiritual sovereignty over Eastern Illyria. He died 422. His history proves the Roman bishop to have been, in his time, dependent on the secular power.—BONIFACE II., elected 630; died in 632. The death of his rival, the anti-pope Dioscorus, a few days after his election, left him in quiet possession of the papal chair. He acknowledged the supremacy of the secular sovereign in a council held at Rome.—BONIFACE III., chosen 607, died nine months after his election.—BONIFACE IV. reigned 608–616. He consecrated the Pantheon (which see) to the Virgin and all the saints.—BONIFACE V., a Neapolitan, was pope from 610 to 625. He confirmed the inviolability of the asylums, and endeavoured to diffuse Christianity among the English.—BONIFACE VI., a Roman, elected 896, died of the gout a fortnight after.—BONIFACE VII., anti-pope, elected 974 during the lifetime of Benedict VI., whose death he was suspected of having caused. Expelled from Rome he returned on the death of Benedict VII., and found the chair occupied by John XIV., whom he deposed and threw into prison,

where he allowed him to die of hunger. Boniface died eleven months after his return.—**BONIFACE VIII.** See the article.—**BONIFACE IX.** Pietro Tomacelli of Naples, succeeded Urban VI. at Rome during the schism in the church, while Clement VII. resided at Avignon. He was distinguished for the beauty of his person and the elegance of his manners, rather than for a profound knowledge of theology and canon law. Even the counsel of his experienced cardinals could not save him from the commission of gross blunders. He was more skilled in the arts of simony and extortion. He sold the same benefice repeatedly, made the annates a regular tax in 1392, and lavished the treasures thus procured on his relations or in costly edifices—the fortification of the castle of St. Angelo, for instance, and the Capitol. He supported the pretensions of Ladislaus to the throne of Naples, and during the greatest part of his pontificate was engaged in negotiations at Avignon with his rivals, Clement VII. and Benedict XIII. He died in 1404.

BONIFACE VIII. **BENEDICT CAJETAN**, born at Anagni of an ancient Catalonian family; elected pope Dec. 24, 1294. He received a careful education, studied jurisprudence, was a canon at Paris and Lyons, advocate of the consistory, and prothonotary of the pope at Rome. After Martin IV. had elevated him to the dignity of a cardinal (1281) he went as legate to Sicily and Portugal, and was intrusted with embassies at several courts; in particular with the charge of reconciling the King of Sicily with Alfonso of Arragon, and Philip the Fair with Edward I. of England. After Celestine V. had resigned the papal dignity at Naples, in 1294, at the instigation of Boniface, the latter was chosen pope. He met with opposition from the cardinals of the family Colonna, and revenged himself by excommunicating them. His induction was magnificent. The Kings of Hungary and Sicily held his bridle on his way to the Lateran, and served him at table with their crowns on their heads. Boniface, however, was not successful in his first efforts for the increase of his power. The sovereignty of Sicily was denied him, and Frederick II. was crowned king there in spite of his excommunication. He was equally unsuccessful in his attempt to arbitrate between England and France. The bulls which he issued at this time against King Philip the Fair of France obtained no consideration. This was also the case with the interdict which he pronounced against him at the Council of Rome in 1302. Supported by the states and the clergy of France, Philip defended his royal rights against the encroachments of the pope. The pope was accused of duplicity, of simony, of usurpation, of heresy, of unchastity; and it was resolved to condemn and depose him at a general council at Lyons. Philip went still further: he sent Nogaret to Italy in order to seize his person and bring him to Lyons. Nogaret united himself for this purpose with Siacarra Colonna, who with his whole family had been oppressed by Boniface, and was in consequence his enemy. Boniface fled to Anagni, where Nogaret and Colonna surprised him. Boniface on this occasion acted with spirit. 'Since I am betrayed,' said he, 'as Jesus Christ was betrayed, I will die at least as a pope.' He assumed the pontifical robes and the tiara, took the keys and the cross in his hand, and seated himself in the papal chair. But the insignia of his holy office did not save him from arrest. Nay, Colonna went so far as to use personal violence. Boniface remained in a disagreeable confinement for two days, when the Anagnines took up arms and delivered him. After this he departed to Rome, where he died, a month later, in 1303. From fear of poison he had not taken any food during his captivity. This abstinence brought on a fever which terminated fatally.

Boldness in his views, and perseverance in his resolutions cannot be denied to Boniface; but these qualities were stained by ambition, vanity, a spirit of revenge, and a mean pliability. Dante assigns to him, as guilty of simony, a place in hell between Nicholas III. and Clement V. Boniface founded, in 1300, the centennial jubilee, and enriched his treasury by the frequent sale of indulgences. He was an accomplished man for the times in which he lived.

BONIFACE, St., the apostle of Germany, who first preached Christianity and spread civilization among the Germans. He was born in England (680), and his original name was Winfrid. In his thirtieth year he was consecrated a priest. A great part of Europe at this period was inhabited by heathens, and several missionaries set out from England and Ireland to convert them. Among these was Boniface, who in 716 conceived the plan of preaching Christianity among the Frieslandians, but was prevented by the war between Charles Martel and the King of Friesland, Radbod. He therefore returned to England, where he was chosen abbot. In 718 he went to Rome, where Gregory II. authorized him to preach the gospel to the nations of Germany. He commenced his labours in Thuringia and Bavaria, passed three years in Friesland, and journeyed through Hesse in Saxony, baptizing everywhere, and converting the Pagan temples to Christian churches. In 723 he was invited to Rome, made a bishop by Gregory II., and recommended to Charles Martel and all princes and bishops. His name Winfrid he changed to Boniface. In 724 he destroyed the oak sacred to Thor, near Geismar, in Hesse, founded churches and monasteries, invited from England priests, monks, and nuns, and sent them to Saxony, Friesland, and Bavaria. In 732 Gregory III. made him archbishop and primate of all Germany, and authorized him to establish bishoprics, the only existing bishopric being the one at Passau. He founded those of Freisingen, Ratisbon, Erfurt, Baraburg (transferred afterwards to Paderborn), Würzburg, and Eichstätt. In 739 he restored the episcopal see of St. Rupert, at Salzburg. After the death of Charles Martel he consecrated Pepin the Short king of the Franks, in Soissons, by whom he was made Bishop of Mentz. He held eight ecclesiastical councils in Germany, founded the famous abbey of Fulda, and undertook in 754 new journeys for the conversion of the heathens. He was killed at Dokum, in West Friesland, by some barbarians in 755, in his seventy-fifth year. In Fulda a copy of the Gospels, in his own handwriting, is to be seen. At the place where Boniface built, in 724, the first Christian church in North Germany, near the village of Altenburg, in the Thuringian forest, a monument has been erected to his memory. The most complete collection of the letters of Boniface was published at Mentz, 1789, folio; and of his entire works, two vols., Oxford, 1845.

BONIN, or **ARZOBISPO ISLANDS**, several groups of islands, North Pacific Ocean, extending from lat. 27° 44' 30" to 28° 30' N., south of and belonging to Japan. The N.W. island of the most northern cluster, called Parry Group, is in lat. 27° 43' 30" N.; lon. 142° 8' E.; the cluster consists of small isles. The largest of the chain is Peel Island, on the W. side of which is a good harbour called Port Lloyd, in lat. 27° 5' 30" N.; lon. 142° 11' 30" E., nearly surrounded by hills crowned with palm-trees. Almost every valley has a stream of water. Green turtle abound in the sandy bays. Sharks are numerous, and fish of several kinds plentiful. Peel Island is inhabited by some English, Americans, and Sandwich Islanders, who cultivate maize, vegetables, tobacco, and the sugar-cane. It is frequently visited by vessels in want of water and fresh provisions.

BONINGTON, RICHARD PARKES, English painter, was born on October 25th, 1801, at Arnold, a village near Nottingham, where his father was a painter and lace manufacturer. When Richard was in his boyhood the family removed to Calais and afterwards to Paris. He early displayed a decided predilection for art, and entered as a student at the Louvre, and was also for a time in the studio of Baron Gros. His genius displayed itself in landscape-painting, and he rapidly rose to great eminence in this department, first in Paris and afterwards in England, to whose Royal Academy Exhibition he contributed several pictures which created a great sensation. He worked at first entirely in water-colour, but from about 1825 he also used oil. A brilliant career was in prospect for him, when he was cut off by pulmonary consumption. This took place at London, to which he had removed for the benefit of medical advice, on 23d September, 1828.

BONITO, a name applied to several fishes of different genera belonging to the mackerel family (Scomberidae). One of these, the bonito of the tropics (*Thynnus pelamyx*), is well known to voyagers from its persistent pursuit of the flying-fish. It is a graceful and beautiful fish, of about 24 feet in length, steel-blue on the back and sides, silvery on the belly, with four brown longitudinal bands on each side. It feeds chiefly on small fish and the higher molluscs, and is good eating, though rather dry. In the Mediterranean the *Auxis vulgaris*, a fish about 15 inches in length, blue along the back, less elegantly shaped than the mackerel, but with a similar tail, is called the bonito, or plain bonito. Both these fishes have been caught in British waters.

BONN, a city of the Prussian province of the Rhine, in the government of Cologne, formerly the residence of the Electors of Cologne, on the left bank of the Rhine, over which there is a magnificent new bridge, erected at a cost of £200,000, with a central span of 600 feet. It is pleasantly situated, is a flourishing place, a favourite residence of English visitors, and has been greatly extended and improved in recent years, though it still has many narrow irregular streets. The town-hall, completed 1782, is one of the handsomest of its edifices. Another important building is the cathedral, cruciform in plan, and forming an imposing and picturesque example of the late Romanesque style of architecture. The greater part of it dates from the thirteenth century. But all other buildings and institutions are eclipsed by the celebrity of the university, the charter of which was given Oct. 18, 1818, at Aix-la-Chapelle, by the King of Prussia, who at the same time endowed it with an annual income of about £12,000. The former residence of the Elector of Cologne was bestowed on the university, and was fitted up at great expense, being surpassed in extent and beauty probably by no university building in Europe. The university possesses a library of more than 220,000 volumes, a museum of antiquities, a collection of casts of the principal ancient statues, a collection of coins, observatory, botanic garden, &c. The paintings in the Academical Hall (among others, the great allegorical picture, the Christian Church) were executed by some pupils of Cornelius. In the front of the university is an extensive garden, with fine old avenues of trees, while from this quarter runs westwards a broad straight avenue, $\frac{1}{2}$ mile long, planted with horse-chestnuts, passing the observatory, and leading to the botanic garden and natural history collections of the university, and to the chemical laboratory, the anatomy building, &c. In this quarter also are grounds and buildings for the use of the agricultural institute. The teachers of the five faculties, of which the university consists, are above 150. Particular advantages are afforded for

the education of young men intended for instructors. Many men distinguished in various branches of science have been connected with the university, including the historian Niebuhr. The exertions of the government to collect in Bonn all the means of instruction, united with the charms of the place and the beauties of the scenery, have made the place famous. The average attendance of university students is above 1700. The manufactures, which are not very important, comprise carpets, machinery, soap, chemicals, stoneware, &c. The means of communication are ample, both by the steamers which ply upon the Rhine and the railways. Prince Albert studied at Bonn, and Beethoven was born there, the house of his birth being now a museum. There are statues of Beethoven and Arndt, a monument commemorative of the war of 1870-71, a monumental fountain, &c. The antiquity of Bonn is considerable, and, as the residence of the Electors of Cologne, it makes some figure in history. Pop. in 1895, 44,558.

BONNER, EDMUND, an English prelate of unenviable notoriety, was the son of a sawyer at Hanley, in Worcestershire, and was born about 1495. He was educated at Pembroke College, Oxford, where he was made D.C.L. in 1525. For his skill in business he was patronized by Cardinal Wolsey, on whose death he acquired the favour of Henry VIII., who made him one of his chaplains, and sent him to Rome on business connected with his divorce from Queen Catharine. In 1535 he was made Archdeacon of Leicester. In 1538 he was nominated Bishop of Hereford, being then ambassador at Paris; but before his consecration he was translated to the see of London. In 1542-43 he was ambassador to the Emperor Charles V. After Edward VI.'s accession in 1547 he was deprived of his bishopric for non-obedience in connection with the injunctions and the Book of Homilies. He was shortly afterwards restored, but still continuing to act with contumacy, he was, after a long trial, once more deprived of his see, and committed to the Marshalsea (1549); from which prison, on the accession of Mary, he was released, and once more restored in 1553. During this reign a most sanguinary persecution of the Protestants took place, many of whom Bonner was instrumental in bringing to the stake, though it appears he was hardly severe enough to meet the wishes of the king and queen. When Elizabeth succeeded he went with the rest of the bishops to meet her at Highgate, but was coldly received. He remained, however, unmolested, until his refusal to take the oath of supremacy; on which he was committed to the Marshalsea (1560), where he remained a prisoner for nearly ten years, until his death, on September 5th, 1569. He was buried at midnight, to avoid any disturbance on the part of the populace, to whom he was extremely obnoxious.

BONNET, or **BONNETTE**, in fortification, an elevation of the parapet at a salient angle, designed to prevent the enfilading of the adjoining front of the work, where it is situated. The bonnet accomplishes, however, only part of this object, and is subject, at least in field-works, to the disadvantage, that the men destined for its defence are too much exposed to be taken in flank by the fire of the enemy, on account of the necessary elevation of the banquette (which see)—a fault which cannot occur in the works of a fortress which are well laid out.

BONNET, CHARLES, a natural philosopher and metaphysician, was born at Geneva in 1720, and exchanged the study of the laws for that of natural history. His essay On Aphides, in which he proved that they propagated without coition, procured him in his twentieth year the place of a corresponding member of the Academy of Sciences at Paris. Soon

afterwards he partook in the discoveries of Trembley respecting the pupæ, and made interesting observations on the respiration of caterpillars and butterflies, and on the structure of the tape-worm. An active correspondence with many learned men in his own country and abroad, and too continued perseverance in labour, brought on an inflammation in his eyes, which prevented him from writing for more than two years. His active spirit employed this interval in meditating on the source of our ideas, on the nature of the soul, and on other mysteries of metaphysics. From 1752 till 1768 he was a member of the great council of his native city. He afterwards retired to his country-seat (Genthod), on the banks of the Lake of Geneva, where he led a retired life, devoting his time to the investigation of nature, to the conversation of learned men, and to an extensive correspondence, till his death in 1793. Bonnet was a close and exact observer. He carried religious contemplations into the study of nature. In his views of the human soul many traces of materialism are to be found; for instance, the derivation of all ideas from the movements of the nervous fibres. Of his works on natural history and metaphysics there are two collections; one in nine vols. 4to, the other in eighteen vols. 8vo, Neuchâtel, 1779. The most celebrated are, *Traité d'Insectologie*; *Recherches sur l'Usage des Feuilles dans les Plantes*; *Considérations sur les Corps organisés*; *Contemplation de la Nature*; *Essai analytique sur les Facultés de l'Âme*; *Palingénésie Philosophique*; and *Essai de Psychologie*.

BONNET-ROUGE, which figured so much as an emblem of liberty during the French revolution, and was then worn as a head-dress by all who wished to show themselves sufficiently advanced in democratic principles, is said by some to have been adopted in imitation of the Phrygian cap of the same colour which was worn by those who had obtained emancipation from slavery, while others maintain that it had a much more lowly origin, and was borrowed either from the Marseillais bands who flocked to Paris, or from a few Swiss soldiers who, having been sentenced to the galleys for insubordination to their officers, obtained their liberty on the acceptance of the constitution in 1790. Having returned in a kind of triumphal procession, wearing the red cap, which had formed part of their galley dress, the fancy of the people was struck, and the bonnet-rouge was considered indispensable to every true patriot. Even the unfortunate Louis XVI. wore it when paraded through the streets, after narrowly escaping with his life from the mob which had burst into his palace. After it had ceased to be generally worn, it became the distinctive badge of the men of the Mountain. During the storms of more recent periods attempts have repeatedly been made to bring it again into fashion. These have not been successful, but the revolutionary cap rejected by France has met with a more favourable reception abroad, particularly among the newly-formed republics of America, where it is often stamped upon coins, or used as an emblem upon seals. Under the restoration of the Bourbons the soubriquet of bonnet-rouges was applied to individuals who either figured in the revolution, or were supposed to hold revolutionary principles.

BONNÉVAL, CLAUDE ALEXANDER, COUNT OF, or ACHMET PASHA, a singular adventurer, was born in 1875 at Coussac, in Limousin, of an illustrious French family, and entered in his sixteenth year the royal body-guard. In the war of the Spanish Succession he obtained a regiment, with which he marched to Italy, and distinguished himself by his valour as well as by his excesses. On his return he was obliged to fly, in consequence of some violent expressions

against the minister and Madame de Maintenon. He was in 1706 appointed major-general by Prince Eugene, and fought against his native country. At the Peace of Rastadt in 1714, by the interference of Prince Eugene, the process against him for high treason was withdrawn, and he was allowed to return to his estates. In 1716 he was lieutenant field-marshal of the Austrian infantry, and distinguished himself by his valour against the Turks at Peterwardein (1716). In 1718 Bonneval was made a member of the Imperial council of war, but his licentiousness and indiscretion induced Prince Eugene to get rid of him, by appointing him in 1728 master-general of the ordnance in the Netherlands. To revenge himself on Eugene, he sent complaints to Vienna against the governor, the Marquis de Prié; but the latter, who, on his side, had not been inactive, received an order to arrest Bonneval, and to imprison him in the citadel of Antwerp. Bonneval being afterwards ordered to appear at Vienna and give an explanation of his conduct, spent a month at the Hague before he chose to comply with the summons. He was therefore confined in the castle of Spielberg, near Brunn, and condemned to death by the Imperial council of war; but the sentence was changed by the emperor into one year's imprisonment and exile. Bonneval now went to Constantinople where the fame of his deeds and his humanity towards the Turkish prisoners of war procured him a kind reception. He consented to change his religion, received instructions in Mohammedanism from the mufti, submitted to circumcision, and received the name of *Achmet*, with a large salary. He was made a pasha of three tails, commanded a large army, defeated the Austrians on the Danube, and quelled an insurrection in Arabia Petrea. His exertions, as commander of the bombardiers, to improve the Turkish artillery, were opposed by the jealousy of powerful pashas, the irresolution of Mohammed V., and the dislike of the Turkish troops to all European institutions. He enjoyed, however, the pleasures of his situation. He died in 1747. The memoirs of his life published in London, 1755 (two vols. 12mo), in French by Desherbiers (Paris 1806, two vols.), under his name, are not genuine.

BONNYCASTLE, JOHN, professor of mathematics at the Royal Military Academy at Woolwich, was born in Buckinghamshire. Though his education was not neglected, yet he was chiefly indebted to his own exertions for the various and extensive knowledge which he acquired. While young, he became private tutor to the two sons of the Earl of Pomfret. After two years he quitted that situation on being appointed one of the mathematical masters at Woolwich. Here, for more than forty years, he devoted his time to the duties of his profession, and to the composition of elementary mathematical works. His first production was the Scholar's Guide to Arithmetic, which has passed through many editions. His guides to algebra and mensuration are useful school books. He likewise wrote a Treatise upon Astronomy, the Elements of Geometry, a Treatise on Plane and Spherical Trigonometry, a Treatise on Algebra, and various articles in the early part of the last edition of Dr. Rees's Cyclopædia. He died at Woolwich, May 15, 1821.

BONPLAND, AIMÉ, a distinguished naturalist, noted as the friend of Humboldt, and the companion of his wanderings, was born at Rochelle on 22d Aug. 1773, studied medicine, and served for a while in the French navy as surgeon. Having returned to Paris to continue his studies, he there made the acquaintance of Humboldt, then a young man actively engaged in the pursuit of scientific knowledge at the French capital. On the latter projecting his journey

to the New World, Bonpland readily agreed to accompany him, and shared in all the adventures and toils of that celebrated expedition (see HUMBOLDT). In the course of it he collected upwards of 6000 plants, previously unknown, and on his return to France in 1804 presented his herbarium to the Museum of Natural History, and had a pension granted him by the Emperor Napoleon. A great friendship subsisted between him and the Empress Josephine, who frequently endeavoured to cultivate in her garden at Malmaison the flowers whose seeds he had brought from the tropics. On the Restoration he proceeded to South America, and became professor of natural history at Buenos Ayres. He subsequently made an extensive journey across the Pampas to the foot of the Andes, and ascended the river Parana into Paraguay, but was arrested by Dr. Francia, the governor of Paraguay, as a spy, and detained a prisoner for eight years till 1829. He afterwards settled at San Borja, near Monte Video, and continued to reside there till his death, which took place in the month of May, 1858.

BONY PIKE, or GAR-FISH (*Lepidosteus*), a remarkable genus of fishes of which there are more than twenty species, all inhabiting America. It is one of the few living forms that now represent the order of ganoid fishes so largely developed in previous geological epochs. Like other fishes of this order, it has the body covered with smooth enamelled scales of a rhombic form, arranged in oblique rows, and so hard that it is impossible to pierce them with a spear. The vertebral column is strongly ossified, and the individual vertebrae are of the 'opisthocœlous' type, that is to say, convex in front and concave behind, thus exhibiting a reptilian character. The snout is elongated, and the jaws are furnished with double rows of teeth, the larger of which also resemble those of reptiles. The tail is heterocercal. These fishes inhabit the lakes and rivers of America, and frequent shallow, reedy, or grassy places. They are voracious animals, and fond of living prey. The common gar-fish, or bony pike (*L. osseus*), attains the length of 5 feet, and is easily distinguished by the great length of its jaws. The alligator gar-fish (*L. ferox*) is usually from 4 to 6 feet long, sometimes, it is said, 12 feet long. The genus *Polypterus*, which inhabits the Nile and other African rivers, is allied to *Lepidosteus*. (See PLATE at ICHTHYOLOGY.)

BONZES, the name given by Europeans to the priests of the religion of Fo, or Buddha, in Eastern Asia, particularly in China, Birmah, Tonquin, Cochinchina, and Japan. As these priests live together in monasteries, unmarried, they have some resemblance to the monks of the Christian church. They do penance, and pray for the sins of the laity (or at least profess to do so), who secure them from want by endowments and alms. The female bonzes may be compared to the Christian nuns, as the religion of Fo suffers no priestesses, but admits the social union of pious virgins and widows, under monastic vows, for the performance of religious exercises. The bonzes are commonly acquainted only with the external forms of worship and the idols, without understanding the meaning of their religious symbols. They endeavour by every means in their power to keep up the superstition by which they are supported.

BOOBY (*Sula fusca*), a bird very nearly allied to the gannet, and so named from the extraordinary stupidity which all the older voyagers agree in attributing to it, who tell us that the birds would sit on the ground and allow themselves to be knocked on the head without attempting to fly. They are widely distributed over the globe, inhabiting the solitary islands and shores in most of the warmer latitudes. They live on fish, which they take, like the gannet,

by darting down upon them when swimming near the surface of the water. When fishing, they are often tormented by the frigate-birds, which attack them and force them to disgorge their prey for their own benefit. They walk with difficulty and seldom swim, but they have wonderful powers of flight.

BOOK, the general name applied to any collection of leaves or sheets made up into a volume. In early times books were made of the bark of trees; hence the Latin *liber* means bark and book, as in English the words *book* and *beech* are connected, beech-bark having no doubt been in early times used as a material to write on. The materials of books were also derived from the *papyrus*, a plant which is a native of Egypt, and which gave its name to paper. The use of parchment, prepared from skins, next followed, until it was supplanted by paper in the twelfth century. See BIBLIOGRAPHY, BIBLIOMANIA, BOOK-BINDING, BOOK-TRADE, PAINTING, &c.

BOOKBINDING, the art of arranging and making up the sheets of a book into a volume. The first operation in bookbinding is to fold the sheets. If the book be folio, each sheet is folded into two leaves; if quarto, into four leaves; octavo, eight leaves; 12mo, twelve leaves; 18mo, eighteen leaves; and so of all others, to 72mo, the smallest size in general use. The first page of each sheet of all English books has, at the bottom, a letter of the alphabet, or a number, the letters or figures forming a consecutive series. These marks, technically denominated signatures, direct the workmen in the proper arrangement of the sheets. After the sheets are folded, they are arranged in the proper order. The book is then beat on a large smooth stone with a heavy hammer, or put through a rolling machine, to make it smooth and solid: care must be taken in beating or rolling it to prevent *setting off* the printing of the one page on the other, which may happen if the ink is not perfectly dry. After beating, the book is separated into three or four portions, and put between smooth hardwood boards, and pressed in a screw or hydraulic press for several hours. It is then carefully *colled*, according to the letter or number at the bottom of the sheet, and sawed on the back, in three or five places, according to the size of the work, in order to admit the cords on which it is to be sewed. When a book has been sewed, it is then secured by a coating on the back of strong glue, care being taken that the sheets be accurately adjusted at the head and back. When the glue has dried, the back is rounded with a hammer, the same as those used by shoemakers; it is then screwed up very tight in the *cutting press*, between hardwood boards, half the breadth of the book, and thinner on the one edge than the other; the boards being kept an eighth of an inch from the edge of the back. The back of the book is now beat smooth, and the edge of the back being beat on the edge of the boards that compress it, a groove is formed for the pasteboard to rest in. The pasteboards are then laced to the book by the ends of the cords on which it is sewed; after the lacing the superfluous parts are cut away, and the rest are hammered smooth. The book is then pressed again for several hours, to make it solid for cutting, which is performed by a machine called a *plough*. The boards ought always to be cut $\frac{1}{4}$ inch longer, and $\frac{1}{4}$ inch broader than the book. The part of the board that projects is called the *squares*, and is a protection to the book.

When the book is cut, it may either be gilt, marbled (see MARBLING), or sprinkled on the edges, or left white, as all law-books are. In order to be gilt, the book is screwed hard up in the cutting press, between two *cutting boards*, and scraped perfectly smooth with a small circular piece of steel, having a sharp edge all round. It is now burnished with a

dog's tooth or agate burnisher; a solution of the white of egg and water being spread over with a sponge; and the gold is laid on with a piece of paper in the ordinary way. After having dried for about twenty minutes, the gold is then burnished.

Sprinkling the edges of a book is performed with a brush. Holding the brush in the right hand, and a bar of iron in the left, the workman dips the brush in the requisite solution, and having beat the brush on the bar till the colour is nearly out, the residuum falls fine, and produces the desired effect. The edges of sprinkled books are either burnished or not at pleasure. The usual compositions for sprinkling are a solution of amber, vermilion, sap-green, or indigo.

The head-band is now added, which is an ornament made of cotton cloth, thread, or silk, of two or three colours, placed at top and bottom of the book, across the leaves, and woven or twisted about a strip of vellum the width of the square. When the book is head-banded, it receives on the back another coat of strong glue; on the top of the glue is laid a piece of cartridge paper the size of the back, and rubbed smooth with a folder. The book is now ready for the leather cover. The cover, after being damped with a sponge and water, and having the edges pared thin on a marble stone, and the rough side smeared with strong paste made of flour, is now pulled on, and doubled over the edges of the boards. The sides and edges are then neatly squared and smoothed, and the bands at the back raised by working the cover with a bone paper-knife, the white or coloured lining papers are inserted, and the book is put for some hours into the press, after which it is ready for its ornaments and letters.

The letters or ornaments on books are made with brass tools engraved in relief. Those parts of the leather on which gold is to be applied are glazed over two or three times with glair, each coating being allowed to dry before another is applied. When dry, the cover is slightly rubbed over with oil or hog's lard, and the gold laid on, the brass tools, after being heated to about 200° Fahr, are then impressed; the superfluous gold-leaf is rubbed off with a piece of cotton cloth. An iron tool, called the *polisher*, heated as above, is then applied, and the book, after being pressed for four or five hours in smooth japanned plates, is considered finished. Leather covers are also often used in which a pattern is previously embossed by means of a powerful fly-press acting on a metal die. The metal die rests on the lower bed of the press, and to the upper bed is attached a counter-die or millboard, which has received its impression from the metal die. Between the two the leather is embossed in an instant.

The above description applies chiefly to the binding of books in leather, and in the strongest manner; but an immense number of books are now bound entirely in cloth, a style of binding which, though less strong, is cheaper and more expeditious. In this case the book is very often left uncut, the projecting side and bottom edges being merely trimmed a little with a large knife without the folds of the paper being cut. The rounding of the back is now commonly effected by means of a machine for the purpose, instead of by the hammer. The cloth covers or 'cases' are made up complete—embossed, gilt, and lettered—before being attached to the book, the ornaments being stamped upon them by presses not very different, except in power, from the fly-press for embossing leather. The covers are attached to the books by means of strips of coarse thin canvas, which are glued to the backs of the books, and which project for $\frac{1}{2}$ inch or $\frac{3}{4}$ inch on each side. These projecting strips are glued to the boards, and to conceal this arrangement, and give a neat finish to

the book, some white or coloured lining paper is glued in. The books are then pressed for a few hours, and may now be said to be finished. So rapidly can books be done up in cloth, that in a large establishment as many as, say, 1000 copies of an octavo book can be finished in about six hours.

Another method of binding, which dispenses with the processes of sewing, gluing, and rounding, is now commonly practised in the case of engravings, atlases, manuscripts, &c., which are either in single leaves, or have little or no margin left for stitching. This method consists in smearing the back of the book, while placed in the press, with a solution of caoutchouc, by which means each paper edge receives a little of this tenacious substance, and all are firmly kept in their places. Such books open up quite flat at once.

No remains of ancient binding, before the art of printing, have been transmitted to our time. After the invention of printing, books were variously decorated in binding. Strength and durability appear to have been the first objects of attention. Sometimes the books were covered with velvet, but most commonly the covers were of wood, planed to a suitable thickness, over which leather or parchment was fastened. Sometimes brass ornaments were affixed to the sides, and pieces of brass were put on the corners of the books with the view of increasing their durability. Some of the most valuable books were covered with clear vellum, then overlaid with gold-leaf, and ornamented with various devices. Not unfrequently the year in which the book was bound appeared in large figures on the cover. In England the monks and students in monasteries were anciently the binders of books. Of their ingenuity and skill the various missals and other works preserved in our public and private libraries furnish abundant evidence. Lesné has sung the mysteries of bookbinding in a poem (1820, 8vo). For anecdotes relative to bookbinding, see Dibdin's *Bibliomania* and *Bibliographical Decameron*.

BOOK-KEEPING is the art or method of recording mercantile transactions according to any fixed system which a merchant or trader may adopt, with a view to making a detailed knowledge of the state or history of his business accessible to himself or others interested in it. A system of some kind is essential to book-keeping; but there is no absolute limit to the differences in detail which the various systems actually adopted may exhibit. There are, however, certain leading principles which, from the similarity of the facts involved, have come to be generally recognized, and which may be called the science, as a practical experience in the details of particular methods may be called the art of book-keeping. To these elementary principles we shall confine ourselves in this article.

Book-keeping is divided, according to the general method pursued, into single or double entry. Book-keeping by single entry is now comparatively little used, except in retail businesses, where, from the number of insignificant transactions, the cost of a formal record exceeds its value. Even in such businesses, however, a system of double entry may be adopted for generalizing the facts originally recorded, and this practice is being gradually adopted by the better class of tradesmen. Book-keeping by single entry is a simple record of transactions without any artificial system. Debts incurred are entered to the credit of the party to whom they are owing in a current or ledger account; debts due to the trader are entered to the debit of the party owing them in the same manner. These entries may be made from any subordinate book, a day-book, sales-book, or bill-book. Cash paid or received is debited or credited in the ledger to the account of the party receiving it or

paying it only when a current account is maintained with that party. A complete cash account does not form a necessary part of book-keeping by single entry, neither does a stock account. When cash and stock are kept, they are usually mere memoranda, having no bearing on the rest of the system. Simple and imperfect as this system is, it is capable, when carefully used, of producing some valuable results. When a balance-sheet of the debts owing and owed is made, this, together with stock and cash in hand, shows the exact state of the business. Theoretically, if stock and cash accounts are kept, the balance-sheet alone should show how the business stands; but it is a simple impossibility for a retail trader, by the system of single entry, to keep his books so accurately as to produce this result, and the attempt would only involve him in inextricable difficulties. Book-keeping by single entry is, however, much worse in practice than in theory; partly for the reason that most of those who bestow much attention on their books adopt the superior system, while those who keep books by single entry include the greater number of those who are careless or unskilful. Nothing is more common in such books than to find two or three current accounts opened for the same individual, a practice which always leads to hopeless confusion. The reason is that when one account gets into difficulties which there is not time to clear up, another is opened to keep future transactions, or it may be only a particular class of them, out of the muddle. These accounts sometimes lie open together for years, while different book-keepers succeed each other, and cross-posting goes on between them, which the system affords no means of checking, until the whole state of affairs becomes a chaos.

Book-keeping by double entry is a system first adopted in the great trading cities of Italy, thence carried to the Netherlands and to England, by which not only are the inconveniences of the method of single entry avoided, but a much more full and accurate account of the historical details of a business may be given. According to the manner in which it is applied, there is no series of financial facts connected with a business which cannot be clearly and systematically represented in this system without confusion or mixture with similar series of facts contained in the same books. The system consists in adopting, in addition to the personal accounts of debtors and creditors contained in the ledger, a series of what are called book accounts, which are systematic records in the form of debtor and creditor of particular classes of transactions. These accounts may be varied to any extent according to the nature of the business, and the kind of information intended to be conveyed by them. A foreign merchant may open an account for every separate shipment he makes, or he may have one account for each market, or for each particular consignee of his goods. A warehouseman may have an account for each particular class of stock, or a single stock account, or one for each department. Each of these book accounts affords an exhaustive record, from a particular point of view, of a certain class of facts; and the information which, when taken together, they are capable of affording is, in its own place, as indispensable for enabling a trader to carry on his business satisfactorily as a knowledge of his debtors and creditors. The name double entry comes from the fact of every entry being made in this system according to a logical relation established between the book and personal accounts opened in the ledger. For every debt incurred some consideration is received. This consideration is represented under a particular class or name in the ledger as the debtor in the transaction in which the party from whom the consideration is

received is the creditor. Thus A buys goods to the value of £100 from B. He enters these in his journal—Stock Acct. Dr. £100 (for goods purchased) To B, £100. The first £100 appears in the Dr. column of the journal, and is posted in the ledger to the debit of Stock Account; the second appears in the Cr. column, and is posted to the Cr. of B. In like manner, when the goods are paid, Cash, for which an account is opened in the ledger, is credited with £100, and B is debited with the same. When the goods are sold (for cash) Stock is credited and Cash is debited. If the amount for which they sell is greater than that for which they were bought, there will be a balance at the debit of Cash, and a balance at the credit of Stock. The one balance represents the cash actually on hand (from this transaction), the other the cause of its being on hand. If there is a loss on the transaction, the balance will be on the other side of these accounts. Ultimately the balance thus arising at Dr or Cr of Stock is transferred to an account called Profit and Loss, which makes the stock account represent the present value of goods on hand, and the profit and loss account, when complete, the result of the business.

This simple illustration will suffice to show the principle of double entry. It is evident that on this principle the entries made on the debtor and creditor side of the ledger must always be exactly alike, and that the balance-sheet (a sheet containing the balances of all outstanding accounts in the ledger) must, if the entries are correctly made, balance exactly, and will not, as in single entry, show the state of the business by a balance on one side or the other. This information is transferred to the book accounts, where it is shown more accurately and in fuller detail. The risk of omitting any entry, which is a very common occurrence in single book-keeping, can hardly be incurred by any degree of carelessness consistent with the keeping of books by double entry. Unless a particular transaction is omitted in every step of its history, the system will inexorably require that its whole history should be given to bring the different accounts into harmony with each other.

In keeping books by double entry there is a natural division of the books composing the set into two classes, called principal and subordinate books. The subordinate books are those in which the transactions are first recorded, and vary both in number and arrangement with the nature of the business and the manner of recording the facts. The most important of these (all of which are not necessarily to be found in the same set) are Stock Book, Cash Book, Bill Book, Invoice Book, Account Sales Book. Sometimes a Waste Book or Day Book (blotter journal) is kept; but being superfluous, it is only a means of creating errors, and is generally banished from a well-organized system of book-keeping. In keeping subordinate books the thing of greatest importance is that they should be made up entirely from authentic documents; that is to say, from the documents actually constituting transactions, coming into or issuing out of the counting-house in which the books are kept. For this purpose all documents received must be carefully preserved and classified, and exact copies or records of all documents issued retained. Sometimes the record is made in the book itself. The bill-book is in fact such a record for bills. When the subsidiary book is not itself the original record of the transaction, it is the custom of the best-regulated counting-houses to make in coloured ink upon each document a reference to the book in which it is entered, and in each entry to the document from which it is taken. The principal books are composed exclusively from the subordinate books and classified documents of the business. In the most perfect system of double

entry they consist of two, the Journal and Ledger. The journal contains a periodical abstract of all the transactions contained in the subordinate books, or in documents not entered in books, classified into debits and credits. Each entry should contain a reference to the subordinate book or document from which it is taken, and every entry in a subordinate book, or every financial document not so entered, should contain a reference (in coloured ink) to a page in the journal in which it is entered. The ledger contains an abstract of all the entries made in the journal classified under the heads of their respective accounts. It is an index to the information contained in the journal, and also a complete abstract of the actual state of all accounts, but gives no further information; while the journal gives the reason of each debit and credit, with a reference to the source where the details of the transaction are to be found. In some systems bills and cash are posted directly into the ledger without passing through the journal. In this case the bill-book and cash-book form part of the principal set. It is better, however, to have a single book which contains the complete abstract of all transactions, and uniform posting to the ledger from a single book is likewise a convenience which outweighs the trouble of journalising the bills and cash. In some businesses it is necessary to keep an account-current book. This is a book containing the details of the journal in the form of arrangement of the ledger. It is made up from the ledger and journal, and presents the various accounts of the business ready for rendering.

BOOKS, CATALOGUES OF. See BIBLIOGRAPHY.

BOOKS, CENSORSHIP OF. Unless we consider the burning of condemned books under the Roman emperors as a censorship, the establishment of this institution must be attributed to the popes; but it cannot be denied that it would have sprung up in a thousand other places even if it had not existed in their dominions. Soon after the invention of printing the popes perceived the influence which this art exerted over the diffusion of knowledge. It was besides doubly dangerous at a time when the authority of the church had been assailed, and was shaking under the load of its abuses. They endeavoured therefore to prohibit first the reading, and secondly the printing, of certain literary works. They enforced the ancient decrees of the church against the reading of heretical books, and introduced an ecclesiastical superintendency of the press in 1479 and 1496, which was more completely established by a bull of Leo X. in 1515. In this the bishops and inquisitors were required to examine all works before they were printed, and thus to prevent the publication of heretical opinions. They went still further. as this papal decree could not be carried into execution in all countries on account of the reformation, they prepared an index of books which nobody was allowed to read under penalty of the censure of the church. This index was commenced by the Council of Trent, in the fourth session of which (1546) the decree of the censorship was renewed; but it was not executed, and was finally left to the popes (twenty-fifth session of 1563), by whom several such indices *Librorum Prohibitorum* have been published. Works of an established character, which could not well be prohibited, it was determined to expurgate. The Duke of Alva caused such an Index *Expurgatorius* to be prepared in the Netherlands; another was drawn up at Rome in 1607; but there are serious difficulties in expurgating books. The papal government still continues the policy of prohibiting to the faithful the reading of works deemed dangerous, and the Congregation of the Index has still its place and functions at Rome.

In Germany the politico-theological controversies gave the first occasion for the introduction of this institution, as they were carried on with the greatest violence on both sides. The decree of the German diet in 1524 prohibited them. By the diet of 1530 a more severe superintendence of the press was established; and this was confirmed by later laws of the empire in 1541, 1548, 1587, and 1577, &c. It was also provided at the Peace of Westphalia, 1648 (Osnabr. Instr., cap. v. sec. 50), that the states should not suffer attacks on religious parties. From that time the emperors have promised, in their elective capitulations, to watch strictly over the fulfilment of this article. In the capitulations of the Emperor Leopold II., 1790, and of the Emperor Francis II., it was further added (art. vi. sec. 3), 'that no work should be printed which could not be reconciled with the symbolical books of both Catholics and Protestants, and with good morals, or which might produce the ruin of the existing constitution, or the disturbance of public peace.' It was, however, not difficult in most Protestant countries for individual authors or literary journals to obtain an exemption from the censorship; and many institutions, academies, universities, &c., were privileged in this way as far as concerned their regular professors. The governments sometimes protected their subjects with great energy; as, for instance, that of Hanover, in the case of Puter and Schloezer.

In France the censorship belonged to the department of the chancellor, and was administered by royal censors. It was first abolished in England. It was formerly exercised by the well-known Star-chamber, and, after the abolition of this court in 1641, by the Parliament. In 1682 it was regulated by a particular statute, but only for a certain number of years. This statute was renewed in 1679, and again in 1692 for two years more. In 1694 the right of the crown to render the printing of writings, journals, &c., dependent on its permission—that is, the censorship—ceased entirely. In Holland, and even in the Austrian Netherlands, a great liberty, if not an entire freedom of the press, prevailed. All that was not permitted to be printed in France appeared in the Netherlands or in Switzerland, at Lausanne and Geneva, to the great advantage of the Dutch and Swiss book-trade.

In Sweden, by an edict of 1766, and accordingly under the aristocratical constitution, the abolition of the censorship was ordered; yet Gustavus III., personally a friend to the liberty of the press, was obliged to retain the censorship, and even to execute it with severity, during the aristocratical machinations which disturbed his reign, and which were but imperfectly counteracted in the revolution of 1771. Gustavus IV. issued an edict soon after he ascended the throne, by which the censorship was retained only in matters of religion, and was administered by the consistories. This, however, was not permanent at first penalties were enacted, and in 1802 the censorship was entirely re-established, committed to the chancellor of the court, and executed with severity. French and German books were prohibited. King Charles XIII., immediately after his accession to the throne, abolished it entirely by a provisional order of April 12, 1809, which was confirmed as an article of the constitution (sec. 86), June 6, 1809. In Denmark, by a royal rescript of Sept. 14, 1770 (under the minister Struensee), the censorship was wholly abolished; neither has it been restored, though the laws by which the liberty of the press has been regulated have been changing, and have sometimes been very oppressive.

In France the censorship, like so many other institutions, was annihilated by the revolution. All the

constitutions, from 1791 to the Charte Constitutionnelle in 1814, declare the liberty of the press one of the fundamental laws. During the republic there was no censorship, but the revolutionary tribunals took its place. Napoleon restored it in another form by the decree of Feb. 5, 1810 (*Direction de l'imprimerie*). Since the restoration it has also undergone various changes. Books of more than twenty sheets have always remained free, but the censorship has been exercised over pamphlets and journals at different periods. Under the government of the Emperor Napoleon III. the censorship was re-established with new penalties, and is still maintained.

In the Kingdom of the Netherlands the censorship was abolished by a fundamental statute of Aug. 24, 1815 (art. cxxxvi.), and this statute is still in force in the Kingdom of Holland. By art. xviii. of the constitution of Belgium, 1831, it is declared that the press is free, and that no censorship can ever be established. In the German states the liberty of the press was much restrained till 1806, the state-attorney having till then had control over it. After 1814 several states abolished the censorship—Nassau (decree of May 4, 1814), Weimar (in the constitution, May 6, 1816), Württemberg (decree of Jan. 30, 1817), Bavaria (May 28, 1818), grand-duchy of Hesse (constitution of Dec. 17, 1820, sec. 35), though with very different provisions as to the responsibility of authors, printers, and booksellers. In accordance with the unhappy decrees of Carlsbad, 1819, and the resolutions of the German diet of Sept. 20, 1819, the censorship in all the states of the German Confederation became one of the conditions of union, but only with regard to books of less than twenty sheets, and journals. These laws were repealed in 1849, but in the course of a few years they were gradually introduced, although in a modified form, and in this form they still exist in most of the separate German states as well as in the empire. In Russia and Austria there is naturally a despotic censorship. In the United States of America a censorship has never existed.

Besides the different degrees of severity with which the censorship is exercised in different countries, it may be divided into different kinds, according to the field which it embraces. 1. A general censorship of the book-trade and of the press, under which even foreign books cannot be sold without the consent of the censors, exists in Russia, Austria, Spain, &c. (Austria has, in the censorship of foreign books, four formulas. A. *admittitur*, entirely free; B. *transcat*, free, but without public advertisements for sale; C. *erga schedam*, to be sold only to public officers and literary men on the delivery of a receipt; D. *damnatur*, entirely forbidden.) 2. A general censorship of the press, extending only to books printed in the country, exists in Prussia (edict of Sept. 19, 1788; order of the cabinet of Dec. 28, 1824; law of the 12th of May, 1851). 3. A limited censorship, only over works of less than twenty sheets, and journals, is at present the law in the states of the German empire. See PRESS (LIBERTY OF THE), and COPYRIGHT.

BOOK-TRADE. This employment, as one of the chief means of literary intercourse, occupies an important place in the history of civilization. Even in ancient times, and accordingly before the invention of printing, the trade had attained a high degree of development, especially among the Romans, and the poet Horace mentions the brothers Scellæ as the chief booksellers in Rome in his time. After the fall of Rome down to the twelfth century, the trade in books was almost entirely confined to the monasteries, and consisted chiefly in the copying of manuscripts and the barter or sale of the copies, generally at a very high price. But about that time the foundation of the universities gave a new form to the trade in

books, at first in Bologna and Paris. A statute of the University of Paris of the year 1232 distinguished between 'stationarii,' booksellers properly so called, who bought books or got them copied on their own account, and again sold them or lent them out; and 'librarii,' that is, dealers in books, who received books at a certain commission from one party and sold them again to others. The trade of both classes, who were regarded as belonging to the university, was regulated by statutes. But besides the booksellers in the university towns, we find also in other places, particularly in Italy, buyers and sellers of manuscripts. In Germany in the fifteenth century Diebold Lauber at Hagenau is conspicuous as a bookseller offering for sale a large store of the most favourite books, 'spiritual and secular, and for the most part finely illuminated.' It was quite natural that the invention of printing in the same century should have a powerful effect on the trade of book-selling. The influence of this art on bookselling was first manifested in the commercial towns and free cities of the German empire. As might have been expected the printers were originally at the same time booksellers, and they were in the habit of disposing of their books at the chief market-towns and places frequented by pilgrims. First, one of the inventors of printing, brought the productions of his press to Paris for sale, and Schöffer, the inventor of the process of casting metal types in a mould or matrix, brought the books which he had printed to Frankfort-on-the-Main, whose world-renowned *fairs* soon became the centre of the German book-trade. But that booksellers sometimes took their works to other places for sale is shown by several booksellers' notices of the years 1470 to 1486 giving intimation of the sale of books at Strasburg, Augsburg, and other towns. Instances of the separation of book-selling and printing are to be found even in the fifteenth century, but it was only in the following century that these two branches of trade began generally to be carried on independently.

The two chief departments of the book-trade are publishing and bookselling by retail in all its branches. For the most part these two departments of the trade are carried on separately, but it is not uncommon for them to be united. The publisher of a book is the one who purchases the copyright of a work, with the condition of printing it at his own cost and making it accessible to the public. Very frequently, however, books are printed at the cost of the author or some learned society, and published on commission; and in this case also the one who brings the book before the public by means of the retail booksellers or otherwise, and whose name appears on the title-page, is called the publisher, although properly speaking the publisher is the one by whom the charges are borne. The sum that is paid by a publisher for the copyright of a work frequently depends on the sale which it has. In order to secure as large a sale as possible, the publisher commonly brings himself into connection with the retail booksellers. The members of this branch of the trade deal in works that have been given to the world by various publishers, from whom they obtain supplies of such new works as belong to their own line of business, and also furnish upon order copies of works that they do not keep in stock.

Second-hand booksellers belong to a special department of the retail book-trade. They deal for the most part in old books, which are no longer to be had in the usual way from the publishing houses, but also in new books that are offered at reduced prices. The second-hand book-trade carried on in Great Britain is very extensive, and employs many dealers. The price of old books depends very much on their condi-

tion; but independent of this circumstance it is very fluctuating and capricious; equally good copies of the same works being frequently to be had in some shops for half or a third of what they can be bought for in others.

In Britain the chief seats of the book-trade are London and Edinburgh, but publishing is also carried on to a considerable extent in Dublin, Manchester, Glasgow, and some other places. The publishers may either deal with the booksellers directly, whom they supply with stock on a running account at a certain fixed deduction from the selling price which is marked on the book, or they may deal with them by means of commission-agents. Large publishers have very frequently commission-agents in the principal cities of the kingdom, and these of course have to supply the booksellers at the same rate as the publishers. In France the centre of the book-trade is Paris, where almost all the books appear which make any pretensions to occupy an important place in literature, and it is an exceptional case when any scientific work appears in the provinces, for which a sale may be expected outside of the district in which it is published. It is even a matter of some difficulty to procure a copy of a book which has appeared at some provincial publishing-house, unless the publisher engages some bookseller in Paris to sell the work on commission. The French publisher usually has a running account with comparatively few retail booksellers or commission-agents, and the credit that is allowed is commonly three, at the most six months. The deduction that is granted by the publisher is quite arbitrary in amount, and often, especially in the case of periodicals and strictly scientific works, very small. It sometimes happens also that the original price of a book is raised, when an edition is almost exhausted and there is little probability of the work being reprinted. All the French booksellers are *bravets*, that is, licensed and sworn to abide by certain prescribed rules. This regulation is justly complained of by the publishers. The Belgian book-trade, which until the conclusion of the treaty of Aug. 22, 1852, between France and Belgium, consisted chiefly in the reprinting of French works, is now closely connected with that of France in its organization. The book-trade of N. America, the chief seats of which are New York, Philadelphia, Chicago, and Boston, is now very considerable. The manner in which it is conducted is almost the same as in England.

The book-trade in Germany presents some peculiarities deserving of attention. The common practice there is for the booksellers to receive supplies of new books from the publishers, 'à condition', that is, in commutation, with liberty to send back to the publisher all the copies that are not sold before the time of settlement at the Easter Fair (*Ostermesse*), or to carry over a part of them to next year's account if the sale has so far been unsuccessful. This is a practice which is rare in other countries, and in France entirely unknown. All business between the publishers and retail booksellers is carried on indirectly by means of commission-agents, especially in Leipzig, but also in Berlin, Vienna, Frankfurt, Stuttgart, Nürnberg, and Augsburg. What is most characteristic of the German book-trade consists in the completeness of the organization of this kind of agency, and it is this also that forms the great advantage of the German system when compared with the systems of other countries. At one time, as has been already mentioned, Frankfurt was the centre of the German book-trade, but about the end of the seventeenth century it gave place to Leipzig, and the fair held at the latter city at Easter is now the occasion on which all the accounts made in the book-trade during the past year are settled. Formerly the

booksellers appeared personally at the fair, but this is at present but rarely the case, every bookseller out of Leipzig having his agent there, who conducts all his business, and stands in constant communication with the other booksellers. A large number of the publishers deposit with their agents at Leipzig a stock of the works which they have published, and commission them to carry out all orders on their account. The retail bookseller sends all his orders to his agent, who communicates them to the Leipzig publishers and the agents of the other publishers. The books that are ordered, if they are in store in Leipzig, are at once supplied by the agent of the publisher to the agent of the retail bookseller, who then despatches them to his principal. If they are not in Leipzig the order is sent on to the publisher, who then sends to his agent the required supplies of books, which are by the same means as before sent on to the retail bookseller. The commission agency is organized in a similar way, although with certain modifications, at all the other places mentioned above. The sale of the productions of the German press is constantly increasing. In most of the chief cities out of Germany there are establishments which devote themselves chiefly to this branch of the business, and which have their agent at Leipzig, and as a rule stand in direct communication also with all the publishing houses of Germany. In Holland, Denmark, Sweden, and Norway are many institutions resembling that of Germany. The book-trade of Poland is carried on to a considerable extent by means of agents at Leipzig. The Russian trade is as yet without any regular organization. In Italy, too, there is no central point either for the production of books or for the conduct of the trade by means of agents. Florence, Milan, and Turin have in both respects nearly the same position.

The total number of works (including new editions) published in Great Britain is now somewhere about 7000 annually. Among the new books works of fiction usually hold the first place in point of numbers, other classes of books that appear in large numbers being theological and biblical publications, educational works, history and biography, and juvenile works—the last very numerous. The books imported into the United Kingdom have an annual value of £250,000 to £280,000. The value of books exported is generally about £1,250,000. For the history of the English book-trade, see Curwen's *History of Booksellers* (London, 1874).

BOOMERANG, a missile or weapon of a peculiar nature used by the natives of Australia. It is from 30 to 40 inches in length, and is made of hard wood. In shape it is curved somewhat like a scimitar or a parabola, or it may have a decided bend in the middle nearly approaching a right angle, the bend being a natural one. The breadth is usually about 3 inches, and while one surface is flat the other is somewhat rounded. Boomerangs are of different kinds—some being used in war, others in the chase, others for amusement. One variety can be hurled so as to turn while in the air and come back almost to the place whence it was thrown. It is this peculiarity that has made the boomerang so famous, though the returning boomerang, if not used merely for amusement, is only used to bring down birds. In throwing, the weapon is grasped by one end, and after a short run hurled straight in front. It then takes a horizontal position and revolves rapidly as it moves obliquely upwards into the air. After a time it curves round, and if he so intends, comes back close to the thrower. It may move for a considerable distance horizontally at only a few feet above the ground, and then suddenly rise vertically upwards with great velocity. The peculiarly irre-

gular character of its path through the air, and the rapid change in its direction of movement, render it a very efficient weapon for killing birds. There is also a special boomerang for killing birds capable of being thrown in a straight course of 200 yards. The Australian natives often throw the boomerang in such a way as to cause it to strike the ground about 30 feet off; this is said to impart increased velocity, and the weapon may even hit the ground a second time and rebound into the air. The war boomerang is larger and heavier than that used in hunting. Weapons similar to the boomerang, or *kiley*, as the Australians also call it, but lacking the property of returning, have been, and still are, used by other races, notably the ancient Egyptians and the modern Abyssinians. Sir Samuel Baker describes the latter as about 2 feet long, and made of a piece of flat hard wood, whose end turns at an angle of 30°. Various derivations of the word have been suggested, one connecting it with a root meaning strike or kill, and another with the native word for wind.

BOONDEE, or BUNDI, a native state of Hindustan, in Rajputana, under British protection, and included in the Haraoth and Tonk Agency; bounded on the N. by Jeypoor and Tonk, on the W. by Udeypore, on the S. and E. by Kotah (the Chambal here forming a natural boundary); area, 2225 square miles. A range of hills running from south-west to north-east, penetrated by few passes and rising to the height of 1793 feet, divides the state into two almost equal portions, that on the south being the more fertile. Much of the state is underwood. The chief river is the Meij, which penetrates the central range, and joins the Chambal near the north-east extremity of the state. It was much more extensive before Kotah and its territory were separated from it. In 1817 more than half the revenues was usurped by Scindia and Holkar, and the peasantry were impoverished by oppressive exactions, but in 1818 the rajah received a considerable addition of territory, together with the town of Paoun, from the British government. The inhabitants are of the Hara tribe, which has given birth to many famous men, and, among others, to Ram Singh Hara, one of Aurungzeb's most renowned generals. The ruler is practically absolute in his own territory. Pop. (1891), 295,675.—BOONDEE, the capital, is picturesquely situated on a steep slope in a gorge in the centre of the hills above mentioned, and its antiquity, numerous temples, and magnificent fountains, give it a very interesting appearance. It is crowned by a fort and surrounded by fortified walls. For picturesque effect its main street is almost unequalled. At its upper extremity stands the palace, built of stone, with turreted windows and battlements, supported partly by the perpendicular rock, and partly by solid piers of masonry 400 feet high. At its lower extremity is the great temple dedicated to Krishna. Pop. 22,644.

BOONE, DANIEL, American pioneer, was born in Pennsylvania on Feb. 11, 1735. He received a very limited education, but early became a daring and skillful huntsman. He married in 1755, but in 1769 left his home and set out with five others to explore the wilds of Kentucky. He rendered valuable assistance to Lord Dunmore in his war against the Indians, and founded a fort called Boonesborough on the left bank of the Kentucky river. To this fort he brought his wife and family and some neighbours, but soon afterwards he was captured by a band of Indians. The Indians kept him a prisoner for a time, and adopted him into their tribe, but, learning that they intended to attack Boonesborough, he escaped at great risk to himself, and traversed 180 miles in order to warn his family and friends of their danger. In subsequent fights

with the Indians Boone lost his brother and one of his sons, and narrowly escaped with his own life. After the erection of Kentucky into a state in 1791 the title to his land was successfully disputed, and he therefore proceeded farther west to Missouri, then in the possession of Spain. Here he received a grant of 8000 acres, of which he was deprived when the country came through Napoleon into the possession of the United States. He was compensated by a grant of 850 acres from Congress. He died in Missouri on Sept. 26, 1820.

BOONGARY, the native name of the tree-kangaroo (*Dendrolagus Lumholtzi*), of North Queensland, differing from the common kangaroo in having the fore-legs nearly as long as the hind ones. It has a long, thickly-furred tail, which assists it in climbing. The back is of a grayish colour, the face and the paws being black.

BOONVILLE, or BOONEVILLE, a city and river port of the United States, capital of Cooper county, Missouri, on the right bank of the Missouri river, here crossed by a fine railway bridge, 43 miles north-west of Jefferson City. It is built on a healthy site about 100 feet above the river. Its manufactures are of but little importance, but some trade is carried on. On June 16, 1861, a Confederate force under Marmaduke was put to flight here by Federal troops under Lyon. Pop. (1890), 4141.

BOORDE, or BORDE, ANDREW, a traveller and physician of the sixteenth century, was born near Cuckfield, Sussex, about 1490. He entered the order of the Carthusians at the London Charterhouse, and in 1521 was appointed suffragan bishop of Chichester. The rigour of the Carthusian discipline was too much for him, and accordingly, about 1528, he obtained a dispensation relieving him from his vow. He then studied medicine on the Continent, returning to England in 1530, but soon afterwards he again visited the Continent, where he studied at the chief medical schools, including those of Orleans, Poitiers, Toulouse, Montpellier, and Wittenberg. His journey extended to Rome and Compostella, and in 1534 he was again in England. His next journey was undertaken at the instance of Thomas Cromwell, in order to ascertain Continental opinion about Henry VIII. In 1536 he was in Scotland, studying and practising 'in a lytle vnyuersyte or study named Glasco', and he speaks of Scotchmen as deceitful, and inveterate haters of the English. During the years 1538-42 he was again on the Continent, and this time he went as far as Jerusalem. While staying in Winchester his open immorality got him into trouble, and he was afterwards lodged in the Fleet prison, London. He died in 1549. Boorde, who popularly calls himself Andreas Perforatus, was the author of several works, among which are the following: *Fyrst Boke of the Introduction of Knowledge* (about 1547), a handbook of Europe, the first of its kind; a *Dyetary* (1542); a medical treatise entitled *Breuyary of Health* (1547); *Boke of Berdos*, a condemnation of the beard, known only through an extant portion of a reply by another writer; a book on *Astronomy*; an *Itinerary of England*; an *Itinerary of Europe*; *Boke of Sermons*, &c. His *Fyrst Boke* contains the first printed specimen of the Gypsy language. Many other works, such as *The Merry Tales of the Mad Men of Gotham*, have been ascribed to Dr. Boorde. Dr. Furnivall edited his *Introduction* and his *Dyetary* for the Early English Text Society in 1870.

BOORHANPOOR, a town of India, in the Decan, in the division of Nerbudda and the district of Nimar, formerly capital of the province of Candeish, on the N. side of the Taptee. When viewed from the

opposite side of the river, it presents rather an imposing appearance. Many of the streets are wide, regular, and paved with stone; as are also the Raj Bazaar and the market-place, an extensive square, the two handsomest places in the town. The most remarkable public edifices are the Lal Kilah, or Red Fort, a palace built by Akbar, and though much dilapidated, exhibiting still many remains of imperial magnificence; and the Jumma Musjeed, or great mosque, built by Aurungezebe. A singular sect of Mohammedans, named Bohrah, have their headquarters here. They are the chief merchants in this part of India, have Arab features, wear the Arab costume, and derive their origin from a disciple of their great Prophet. Boorhanpoor was formerly famous for its muslin and flowered silk manufactures, which are still carried on to a considerable extent. Pop. (1881), 30,017; (1891), 32,252.

BOORO, one of the Molucca Islands in the Indian Archipelago, w. of Amboyna, belonging to the Dutch. It is oval in shape, 92 miles long, and 70 broad. It has several bays, of which Cajeli is the largest, and contains a safe harbour sheltered from the monsoons. Viewed from this bay the island has a very fine appearance. In the foreground the minarets and native houses are seen through the openings of the rich tropical vegetation; while lofty mountains, wooded to their summits, shut in the view. The island is watered by 125 streams, large and small. On the N.W. side there are vast swamps, swarming with crocodiles. The island contains some high mountains—Mount Tumahu having an altitude of 8530 feet. Booro produces a variety of valuable woods, balsams, resins, and odoriferous flowers. The chief article of export is cajuput oil, of which about £10,000 worth is exported yearly; most being sent to Java. The tree from which it is obtained (*Melaleuca cajuputi*) grows also upon the islands of Amboyna, Ceram, Celebes, and Sumatra; but the best oil is procured in Booro. The pop. (about 60,000) consists of Alfoures in the interior, and Malays on the coast.

BOOROOJIRD, BURUJIRD, or BOOROJIRD, a town of Persia, province of Luristan, capital of a district of same name, 190 miles N.W. from Isfahan, with a castle and several mosques. It lies in a fertile and well-cultivated valley, yielding saffron, belonging to the Lack tribe. Pop. 20,000.

BOOTAN, or BHOTAN, an independent state of N. Hindostan, having Bengal and Assam on the E., Sikkim on the W., and Tibet on the N., its eastern boundaries being imperfectly known; area about 15,000 square miles. It forms a portion of the declivity of the stupendous Himalayan chain of which Tibet occupies the table-land. Notwithstanding it is mountainous, and in many parts extremely cold, the country is productive and highly cultivated, the slopes of the mountains being cut into terraces for this purpose. As it is situated without the tropics, it is free from periodical rains; and the climate is, in general, moderate, calculated to bring forth both European and Asiatic fruits and vegetables. Thus we find the trees and shrubs of Northern Europe in sight of the large forests and rank vegetation of plants strictly Asiatic. The Deb Rajah is the ruler in temporal affairs; but there is also a spiritual ruler, the Dherma Rajah. Their rule is more nominal than real, however, there being several almost independent chiefs. A yearly tribute is paid to Tibet. The inhabitants are robust, active, and courageous. They have the Mongol features, and profess the Buddhist religion. Their houses are, in general, of only one storey, but the palace of the rajah is a lofty pile. From the precipitous nature of the country they are obliged to use numerous bridges, many of which are constructed with ropes and iron chains. Bootan pro-

duces a hardy breed of horses, about 13 hands high, of a piebald colour and fine symmetry. Rice, wheat, and barley are the chief crops. Bootan trades with all the neighbouring countries, but chiefly with Tibet and Bengal, exchanging horses, linen cloth, musk, walnuts, oranges, Indian madder, &c. for woollens, cottons, sandal-wood, indigo, and spices. The chief manufacture is that of paper made from the bark of a tree. The capital is Tassissudon. The Bootanese have often given trouble to the English; and in 1885 they had to cede a part of their territory (the Doocars, now forming part of the districts of Darjiling and Julpigoree in British Cooch Behar). As, however, Bootan was mainly dependent on the Doocars for revenue, the government of India has agreed to allow the ruler of the state a subsidy of £5000 during good behaviour. Estimated pop. 20,000.

BOOTES (that is, ox-driver, from Gr. *bous*, an ox), a northern constellation, called also by the Greeks, *Arctophylax*. Arcturus was placed by the ancients on his breast; by the moderns, on the skirt of his coat. Fable relates that Philomelus, son of Ceres and Jason, having been robbed by his brother Phatus, invented the plough, yoked two bulls to it, and thus supported himself by cultivating the ground. Ceres, to reward his ingenuity, transferred him, with his cattle, under the name of *Bootes*, to the heavens.

BOOTH, BARTON, an actor of great celebrity in the reigns of Queen Anne and George I., was born in 1681, and placed under Dr. Busby, at Westminster School. An early attachment for the drama was fostered by the applause he met with while performing a part in one of Terence's plays, at the annual exhibition in that seminary. He eloped from school at the age of seventeen, and joined Aahbury's company of strolling players, with whom he went to Dublin. After performing three years in the Irish capital with great applause, he returned in 1701 to London, and, engaging with Betterton, met with similar success. On the death of that manager he joined the Drury Lane company, and on the production of Cato in 1712 raised his reputation as a tragedian to the highest pitch by his performance of the principal character. It was on this occasion that Lord Bolingbroke presented him from the stage-box with fifty guineas—an example which was immediately followed by that nobleman's political opponents. Declamation, rather than passion, appears to have been his forte, though Gibber speaks of his Othello as his finest character. He became a patentee and manager of the theatre in 1713, in conjunction with Wilks, Cibber, and Dogget, and died May, 1733. He was buried in Westminster Abbey, where there is a monument to his memory. He was the author of *Dido* and *Æneas*, a mask, various songs, &c., and the translator of several odes of Horace.

BOOTLE, a mun. and county borough, England, in Lancashire, at the mouth of the Mersey, and adjoining Liverpool, the docks of which great seaport extend into the borough, covering 370 acres and constructed at a cost of £2,500,000. The principal buildings are the town-hall and municipal buildings, school-board offices, and hospital. Many churches provide for the public worship of the inhabitants. The trade of the town is almost exclusively connected with shipping, timber being the chief import; most of the American steamers have their loading berths here. There are large jute-mills, corn-mills, foundries, &c. Bootle has ample railway facilities (the Lancashire and Yorkshire, the London and North Western, and the Midland Railways having each two stations), and there are tramway cars. The Leeds and Liverpool Canal passes through it. There is a municipal electrical station. The history of the place is included in that of

Liverpool. It was incorporated in 1868. Pop. (1871), 16,187; (1891), 49,217; (1901), 58,568.

BOPAL. See **BOPAL**.

BOPP, FRANZ, one of the most distinguished philologists of modern times, born at Mainz, Sept. 14, 1791; died at Berlin, Oct. 23, 1867. With the intention of devoting himself exclusively to the study of oriental literature, he went in 1812 to Paris, where he remained five years and enjoyed the friendship of Chézy and Silvestre de Sacy. He then lived for some time in London and at Göttingen, and in 1821 received an extraordinary professorship in the University of Berlin, which continued to be his place of residence during the remainder of his life. In 1822 he became a member of the Academy of Sciences there, and in 1825 was appointed ordinary professor of oriental literature and general philology. By his editions of Sanskrit texts—several episodes from the great Indian epic poem Mahabharata, with translations and notes (Lond. 1819; 2d ed. Berl. 1832; with a metrical translation, 1838); Ardschuna's Reise nach Indra's Himmel (Ardschuna's Journey to Indra's Heaven; Berl. 1824); and Diluvium (Berl. 1829)—and the preparation of highly useful grammatical works, he contributed greatly to the advancement of the study of the old Indian language. But his most important contribution to philology is his *Vergleichende Grammatik des Sanskrit, Zend, Griechischen, Lateinischen, Litauischen, Altlawischen, Gotischen, und Deutschen* (Comparative Grammar of the Sanskrit, Zend, Greek, Latin, &c., Berl. 1834; 2d ed. greatly altered, three vols. 1857-61; 3d ed. 1868-71). An English translation was published in three vols. 1846-50. The great value of this work lies in this, that here for the first time it was clearly demonstrated that the languages of all the races belonging to the great Indo-Germanic stock have arisen out of a common tongue, which now indeed no longer exists as a separate language, but the structure of which we are able, by a philological comparison of the sister languages sprung from it, to restore to a great extent with almost mathematical certainty. Among the numerous other works of Bopp, his *Critical Grammar of the Sanskrit Language* (*Kritische Grammatik der Sanskritsprache*; Berl. 1834; 4th ed. 1868) deserves mention.

BORA, KATHARINA VON, wife of Luther, was born in 1499. She took the veil very early in the nunnery of Nimptohen, near Grimma; but feeling very unhappy in her situation, applied, with eight other nuns, to Luther, whose fame had reached them. Luther gained over a citizen of Torgau, by the name of Leonard Koppe, who, in union with some other citizens, undertook to deliver the nine nuns from their convent. This was done the night after Good Friday, April 4, 1523. He brought them to Torgau, and from thence to Wittenberg. At the same time, to anticipate the charges of his enemies, he published a letter to Koppe, in which he frankly confessed that he was the author of this enterprise, and had persuaded Koppe to its execution; and he also exhorted the parents and relations of the virgins to admit them again into their houses. Some of them were received by citizens of Wittenberg; others who were not yet too old Luther advised to marry. Among the latter was Katharina, whom Philip Reichenbach, at that time mayor of the city, had taken into his house. Luther proposed to her (by his friend Nicholas von Amsdorf, minister in Wittenberg) Dr. Kasper Glaz and others in marriage. She declined these proposals, but declared her willingness to bestow her hand on Nicholas von Amsdorf, or on Luther himself. Luther, who in 1524 had laid aside the cowl, was not averse to matrimony, yet appears to have been led to the resolution of marrying by reason rather than by passion.

This step gave rise to many disadvantageous rumours, some of them as shameful as they were unfounded. After Luther's death Katharina removed from Wittenberg to Leipzig, where she was compelled to take boarders for her support. She afterwards returned to Wittenberg, and finally removed to Torgau, where she died, Dec. 27, 1552. In the church of Torgau her tombstone is still to be seen, on which is her image, of the natural size.

BORACIO ACID, BORAX, BORON. Boracic acid, uncombined but not pure—for it is often mixed with sulphur—is found abundantly as a beautiful sublimate in small pearly crystalline scales in the crater of Volcano, one of the Lipari Islands. In Tuscany it is contained in the steam which, along with sulphureous exhalations, ammonia and other substances, issues from fissures in the soil. On account of its having been obtained at Sasso, the acid is called by mineralogists sassolin. It occurs besides in mineral waters, and combined with various metals in minerals, of which boracite, hayasine, natroborealcite, stassfurtite, and tincal, the native borate of sodium or borax, are the most important. The acid is generally prepared for chemical purposes by decomposing a hot solution of borax with sulphuric acid. As the solution cools, the boracic acid forms a crystalline crust over the fluid, and gradually deposits on the sides of the vessel. It is collected, and after washing and recrystallization is tolerably pure. It forms pearly hexagonal scales, with a somewhat greasy feeling, and a bitterish taste. It dissolves in water and very readily in alcohol, to the flame of which it imparts a peculiar green colour. The acid is further characterized by turning the yellow colouring matter, turmeric, brown. When an aqueous solution of the acid is heated, the steam carries away considerable quantities of the acid with it; but if the acid be heated alone, the water it contains is expelled, then the acid fuses, and is converted into a white or gray glassy mass called vitrified boracic acid. In this state it is not volatilized except at temperatures approaching a white heat. Hence at high temperatures it expels the more volatile acids, such as sulphuric, from their compounds, while the reverse is the case in solutions at low temperatures.

The preparation of boracic acid from its native aqueous solutions is an interesting process, on account of the natural obstacles which have to be surmounted. The apparently simple operation of concentrating the water in which the acid is dissolved is one of great practical difficulty, because in Tuscany, where the solution is found, there is no available fuel. This drawback has been overcome by Count of Monte Cerboli, Sig. Lardarello, who has contrived to utilize the volcanic heat of the district to concentrate the solution. The method has been so successful that eight or nine large works spread over a district of several square miles contrive to produce upwards of 800 tons of boracic acid per annum. The following is an outline of the process:—Round the cracks in the soil, called fumaroles, or *solfioni*, from which the steam containing not a half per cent of the acid issues, and inlosing the small lakes or lagoons in which it condenses, brick tanks are built on different levels, but communicating with each other. These are supplied with cold water, in which the steam is further condensed. As the steam passes up under considerable pressure, the water in the lagoons seems to boil, and it is sometimes projected to a considerable height in the air. When the water is sufficiently saturated it is run off into a deep vessel, where it is allowed to stand until the black mud mechanically suspended in it deposits, and then the clear fluid is run into a series of large shallow evaporating pans of lead. These pans are heated by steam from other *solfioni*, which

is made to pass under them by a system of flues. As the evaporation proceeds, the fluid becomes richer in boracic acid, and when it has at last reached a certain specific gravity, it is passed into a deep vat, where it is allowed to cool, and where the boracic acid deposits. In this state it is impure, but it is improved by recrystallization, and it is then packed in casks and exported. Commercial boracic acid contains sometimes as much as 25 per cent. of foreign matter, consisting of sulphates and other salts of the alkalies, of calcium and magnesium, clay, and other impurities. The most important of these foreign matters is ammonia, which is present in such quantity that it is regularly collected when boracic acid is converted into borax.

This is the almost sole use to which the acid is put, and it is effected by dissolving crystallized carbonate of sodium in water, and then adding the proper amount of boracic acid. During the combination carbonate of ammonium is given off, which is saved by passing it into sulphuric acid.

Previous to the utilization of the Tuscan boracic acid, native borax was imported, under the name of *tincal*, from India. As imported it is in small pieces of a dirty yellowish colour, and is covered with a fatty or soapy matter. The tincal was formerly purified in Venice and in Holland by a process which was kept secret, but which consisted apparently in boiling it with lime to remove the fatty matter, filtering from impurities, and after some labour getting it in crystals. The tincal is found in various salt lakes in Asia, and a description of one of these is given in a paper on the Botany and Geology of Thibet, appended to Captain Samuel Turner's Visit to the Court of Teshoo Lama (London, 1800, 4to, 406). The lake, said to be some 20 miles round, is situated in a bleak mountainous region, fifteen days' journey northward from Teshoo-lama, and is frozen for the greater part of the year. It is supplied only by springs, and its level varies very little. The water contains common salt and borax, and large deposits of these compounds are continually forming in the bottom and on the border of the lake. During summer the natives go to the lake, break up the masses, and send them to Calcutta and other ports. The crude tincal is employed in Thibet for soldering and as a flux. The crude tincal, after being greased, is exported; but sometimes it has been subjected to partial purification before exportation.

Since the Tuscan method was introduced, and since other sources of boracic acid in North and South America, and still more recently in the salt mines at Stassfurt, have been rendered available, the demand for tincal has been very much smaller, and the price of borax has been reduced.

Pure borax, the anhydrous borate of sodium, forms large transparent six-sided prisms, which dissolve readily in water, effloresce in dry air, and when heated melt in their water of crystallization, swell up, and finally fuse to a transparent glass. In this state borax dissolves metallic oxides, which frequently impart to it characteristic colours. From this property borax is employed in soldering metals, as it removes films of oxide, and leaves the metals in metallic contact with each other, and with the solder. It is also employed in making fine glaze for porcelain, as it renders the materials more fusible. In medicine it is employed in ulcerations and in skin diseases.

Another native compound of boracic acid is the borate of magnesium, or *boracite* of mineralogists. It occurs in beds of anhydrite and gypsum at various localities in Germany, in the form of small cubes, which are colourless, though they are sometimes of different tints, and which are truncated on the edges and on four of the solid angles. This mineral is remark-

able for becoming, when heated, electrified negatively at the perfect angles, and positively at the truncated angles. It is slowly soluble in water and in acids, and is fusible before the blow-pipe. A heteromorphous variety of this mineral is called *stassfurtite*, because it is found in the salt mines of Stassfurt. It is used as a source of boracic acid and borax. Hayezine, occurring in Nova Scotia, and tiza, occurring near Iquique in South Peru, are double borates of calcium and sodium containing water and traces of sulphuric acid and chlorine. They are found in small soft rounded lumps, which, when broken, present a silky appearance from consisting of a mass of the finest crystalline threads interwoven with one another.

These compounds are derived from the element boron, which was discovered about the same time by Gay-Lussac and Thénard, and by Sir Humphry Davy. The separation was effected by decomposing vitrified boracic anhydride with potassium, and purifying the resulting boron by washing with water and hydrochloric acid. Other methods have been since contrived which are more convenient and economical. Obtained by these processes, boron is a dark brown or green amorphous powder, which stains the skin, has no taste or odour, and is only slightly soluble in water. It does not change, except in density, when exposed even to a white heat, provided it be surrounded by a gas with which it does not combine; but if it be heated in the air, or in oxygen, it burns more or less brilliantly, and is converted into boracic anhydride. It is also acted on to a greater or less extent by chemical reagents, such as sulphuric, nitric, and hydrofluoric acids, by chlorine, by alkalies, alkaline salts, &c. It is one of the few elements which combine direct with nitrogen.

Besides the amorphous boron, which corresponds with the amorphous form of carbon, there is another which resembles the diamond, and is accordingly called the *adamantine* or *diamond boron*. Boron is therefore an *allotropic* substance. The diamond form is prepared either by heating the amorphous boron with aluminium in a crucible suitably arranged, or by heating a mixture of a boron compound with aluminium, or with aluminium and carbon. After the action is over, the boron is found crystallized in the aluminium, from which it is removed mechanically, or by dissolving away the alumina and other impurities present. The diamond boron, however, is said to contain small quantities of carbon (as diamond) and aluminium, and to owe its properties in some measure to their presence. Thus three varieties, of different colours, shapes, and composition, have been described, so that it seems doubtful how far the adamantinite is an allotropic condition of the element. The substance, however, is infusible in the oxyhydrogen blow-pipe, and undergoes only superficial oxidation when heated in oxygen. It is not attacked by acids, and only slowly by fused alkalies and alkaline carbonates and sulphates. It is extremely hard—so hard that it scratches ruby, and its dust has been used for polishing diamonds.

Boron forms compounds with the non-metallic elements, of which that with oxygen already described is the most important.

From various considerations, especially that of its allotropy, boron has been generally classed along with carbon and silicon. It seems more accurate, however, to put them in separate groups, as the chemical analogies between it and the other two are by no means so striking as was formerly supposed.

BORAGO, or BORAGE, a genus of plants belonging to the nat. order Boraginaceæ, and characterized by soft, mucilaginous, and emollient properties. *Borago officinalis* gives a coolness to beverages in

which its leaves are steeped, and from the exhilarating qualities which it was erroneously supposed to possess, ranked with alkanet, roses, and violets as one of the four cordial flowers.

BORAX. See BORAXIC ACID.

BORDA, JEAN CHARLES, an engineer, and afterwards a captain in the French marine, famous for his mathematical talents, was born at Dax, in the department of Landes, in 1733. In 1756 he was chosen a member of the Academy of Sciences, and occupied himself in making experiments on the resistance of fluids, the velocity of motion, and other topics relating to dynamical sciences. In 1761 he published a dissertation on hydraulic wheels, and afterwards one on the construction of hydraulic machinery. In 1771, with Verdun de la Crenne and Pingré, he made a voyage to America, to determine the longitude and latitude of several coasts, lakes, and shoals, and to try the utility of several astronomical instruments. In 1774 he visited the Azores, the Cape Verde Islands, and the coast of Africa for the same purpose. In the American war he was very useful to the Count d'Estaing by his knowledge of navigation. In later times he visited a second time the Azores, the Cape Verde Islands, and the coast of Africa; but the observations which he made in this voyage have not been published. Borda was the founder of the schools of naval architecture in France. He invented an instrument, of a very small diameter, which measures angles with the greatest accuracy, and which has been used in measuring the meridian; the reflecting circle, which has made his name immortal; besides an instrument for measuring the inclination of the compass-needle, and many others. On the establishment of the National Institute, he became one of its members, and was occupied with other men of science in framing the new system of weights and measures adopted in France under the republican government. Among the latest of his labours was a series of experiments to discover the length of a pendulum which should vibrate seconds in the latitude of Paris. The principal of his writings are his *Voyage*, published in two vols. in 1778, and his *Tables Trigonométriques Décimales*, which have been edited by Delambre. He died at Paris in 1799.

BORDEAUX, one of the most important cities of France, capital of the dep. of Gironde, is situated on the left bank of the Garonne, about 70 miles from the sea, and 284 s.w. of Paris. Pop. (1896), 256,906. It is built in a crescent form round a bend of the river, which is lined with fine quays for more than 3 miles, and is crossed by a magnificent stone bridge of seventeen arches, finished in 1821 at a cost of £260,000. There is another bridge, a fine iron structure, for the railway from Paris. Bordeaux consists of an old and a new town, the boundary between them being formed by a wide and handsome street which, commencing at the quay near the centre of the crescent, stretches across the city from E. to W. The old town, lying to the S. of this street, is mostly composed of irregular squares and narrow crooked streets; while the new town is laid out with great regularity, and on a scale of magnificence hardly surpassed by any provincial town in Europe. The objects chiefly deserving of notice in the old town are the arch called the *Porte de Bourgogne* at the extremity of the bridge, forming the principal entrance to the town; the cathedral, a fine Gothic edifice built at different periods; St. Michael's Church, with a lofty detached tower, and a superb front of florid Gothic; the Church of St. Croix, a specimen of gorgeous Romanesque; the bourse or exchange, the custom-house, the Hotel de Ville, once the residence of the Archbishops of Bordeaux, and the Palais de Justice. The new town is not so rich in public buildings. The

most conspicuous are the library (190,000 vols.), the museum, and the theatre, a Grecian structure, regarded as the handsomest edifice in Bordeaux. Among the beneficent establishments the first place is due to the grand hospital or infirmary, which occupies the highest site in the town and is admirably arranged. Few cities are so well supplied with extensive and finely-planted promenades. Bordeaux is the seat of a court of appeal, of courts of the first instance and of commerce; and has an academy of science, literature, and art; a preparatory school of medicine and pharmacy; a lyceum; a normal school for female teachers; a school of hydrography and navigation; a school of painting and design; a botanic garden, an observatory, various literary and scientific associations, and a branch of the Bank of France. There are consuls resident here from all the states of Europe and North and South America. The position of Bordeaux gives it admirable facilities for trade, and enables it to rank next after Marseilles and Havre in respect of the tonnage employed. Large vessels can sail up to the town, which by railway, river, and canal communicates with the Mediterranean, with Spain, and with the manufacturing centres of France. The chief exports are wine and brandy; drugs, dyes, and fruits are also largely exported. Sugar and other colonial produce and wood are the chief imports. Ship-building is the chief branch of industry, and there are also sugar-refineries, woollen and cotton mills, potteries, soap-works, distilleries, &c.

Bordeaux is the *Burdigala* of the Romans. In the fifth century it was in possession of the Goths, and it was pillaged and burned by the Normans. By the marriage of Eleonor, daughter of the last Duke of Aquitaine, to Louis VII., it fell into the hands of France. But in 1152 the princess was repudiated by her husband, and married to Henry of Anjou, who ascended the throne of England in 1154, as Henry II., and transferred Bordeaux to that crown. After the battle of Poitiers, Edward the Black Prince carried John, king of France, prisoner to Bordeaux, where he resided eleven years. Under Charles VII., in 1451, it was restored again to France. In 1648 the citizens rebelled on account of a tax on salt, and the governor De Morens was put to death, for which the constable of Montmorency inflicted a severe punishment on the city. During the revolution it was devastated as the rendezvous of the Girondists, by the Terrorists, almost as completely as Lyons and Marseilles. The oppressiveness of the continental system to the trade of Bordeaux made the inhabitants disaffected to the government of Napoleon, so that they were the first to declare for the house of Bourbon, March 12, 1814. The Roman poet Ausonius was a native of Bordeaux. Montaigne and Montesquieu were born in the neighbouring country, and the latter lies buried there in the church of St. Bernard. For the wines of Bordeaux, see BORDELAIS WINES.

BORDELAIS WINES. The finer red wines of the Bordelais (country round Bordeaux) are the best which France produces. They contain but little alcohol, keep well, and even improve by removal. As the original fermentation is complete, they are, if judiciously managed, less subject to disorder and acidity than the Burgundy wines. None of the very best quality, however, is exported pure; a bottle of the best Château-Margaux, or Haut-Brion, is a rarity hardly to be procured in Bordeaux itself, at the rate of six or seven francs a bottle. For export, the secondary growths of Médoc are mingled with the rough Palus. The red wines of the Bordelais are known in England and North America under the name of *claret*. They have less aroma and spirit, but more astringency than the Burgundy wines.

The Bordelais are the safest wines for daily use, as they are among the most perfect of the light wines, and do not easily excite intoxication. In this respect they contrast with the Burgundy wines, which have more generous qualities than those of the Bordelais. The Bordelais wines have sometimes been accused of producing the gout, but this disparagement is without reason. Persons who drench themselves with madeira, port, &c., and indulge in an occasional debauch of claret, may indeed be visited in that way; because a transition from the strong, brandied wines to the lighter is always followed by a derangement of the digestive organs.

The principal vineyards are those of Médoc, Graves, Palus, and Vignes Blanches; after these, those of Entre-deux-Mers, St. Emilion, and the Bourgeois are the most important. The first growth of Médoc are the famous wines of Château-Margaux, Lafitte, and Latour. The Lafitte is characterized by its silky softness on the palate, and a perfume partaking of violet and raspberry. The Latour is fuller, has more aroma but less softness. The Château-Margaux is lighter than the Latour, and delicate like the Lafitte, but has not so high a flavour. Of the second growth, we may mention the Rauran and the Léoville. The average produce of the first growth is 100 *tonneaux* (of 217 gallons each). The soil of Médoc is a sandy and calcareous loam. The gravelly lands (*les Graves*) to the s. and w. of Bordeaux produce the Graves. The first growth of the red Graves is the Haut-Brion, which rivals the first growth of Médoc; it has more colour and body, but is inferior in aroma and taste. The principal white Graves are St. Bris and Carbon-leux. The best Médoc ought to be kept three or four years before removal; the Graves five or six. The wines of Palus, which is a bed of rich alluvial deposits, are inferior to the preceding; they are stronger and more deeply coloured than those of Médoc. Being hard and rough, they are improved by a voyage, and are principally sent to the East Indies and America as *vin de cargaison*, or are mixed with Médoc which is intended for exportation. By the voyage they become more light and delicate, but are not to be compared with the growths of Médoc and the Graves. The best are Queyries and Mont Ferrand. The former are deeply coloured, and have much body. Ago gives them an agreeable aroma, resembling that of a raspberry.

Among the white Bordelais wines, besides those already mentioned, the finest growths are Sauternes, Preignac, Barsac, and Bommes. Martillac and St. Médard are of a good quality, and have lightness and body. Dariste, formerly *Dulamon*, is equal to St. Bris and Carbon-leux. Among other red wines are the Bourgeois, which are of a fine colour, and acquire by age lightness and an agreeable almond aroma: of all the Bordelais wines they most resemble the Burgundy wines. The first growths are Deboquet, Château-Kousset, Tajac, and Palfax. The Bourgeois wines were formerly preferred to Médoc. The wines of St. Emilion have been much esteemed. The Fonsac and Canon are the best. Those of Entre-deux-Mers become agreeable with age. The *vins des Côtes* are good *vins ordinaires* ; they are generally firmes and hard, and improve by age. The best are those of Bassens and Canon. See Henderson's History of Ancient and Modern Wines.

BORDENTOWN is a pleasant town in New Jersey, on the E. side of the Delaware, 26 miles N.E. of Philadelphia. It has several large foundries and other extensive manufacturing establishments. It was some time the residence of Joseph Bonaparte, ex-king of Spain. Pop. (1890), 4232.

BORDONE, PARIS, a celebrated painter of the Venetian school, born at Treviso in 1500; died in

1570. Under Titian he made rapid progress in painting. The execution of many works for his native city and for Venice spread his fame as far as France, whither he was invited by the king. The galleries of Dresden and Vienna possess several of his pieces. His most famous picture is the Old Gondolier Presenting a Ring to the Doge; it is painted in oil and now to be seen at Venice.

BORE, a name probably of Icelandic origin, and used to designate a very remarkable phenomenon which occurs in some rivers in spring-tides. At such times as the tide advances the water is suddenly thrown in as if in a mass, and then pursues its course up the river, and in opposition to the current, presenting a volume of water moving with great rapidity and resistless force, and with a height varying from 2 or 3 feet, as in the Severn, Trent, Solway, and Dee, to more than 12 feet in the Brahmapootra. The circumstances in which the bore occurs afford an easy explanation of its cause, and show that it is produced by the disproportion between the volume of the tidal wave and the receiving power of the rivers into which it is thrown.

BOREAS, the north wind, worshipped by the Greeks as a deity; residing in Thraee, and represented with wings, which, as well as his hair and beard, were full of flakes of snow; instead of feet he had the tails of serpents, and with the train of his garment he stirred up clouds of dust. Boreas was the son of Astræus and of Eos. When Apollo and his favourite Hyacinthus were once playing at quoits, he blew the quoit of the former, of whom he was jealous, upon the head of the youth, who was killed by the blow. By Oreithyia, daughter of Erechthides of Athens, he was father of Cleopatra, Chione, Calais, and Zetes. The last two partook in the Argonautic expedition.

BORELLI, GIOVANNI ALFONSO, born at Naples in 1608, after studying medicine, both practised and professed it at various places, but particularly at Pisa and Florence, and distinguished himself as the leader of those who have been called mathematical physicians, from regarding the human body as a kind of hydraulic machine, and then attempting to explain all its motions and functions in accordance with the principles of mathematics. He died at Rome Dec. 31, 1679. He appears to have possessed very original and inventive powers, and made various discoveries, among which may be mentioned that of an apparatus apparently of the nature of a diving-bell, by which persons could descend into the water, remain in it and move about or rise and sink at pleasure, and of a boat by which two or more persons might row themselves beneath the water in any direction. His works discuss many important subjects in medicine, mathematics, and philosophy; but the great work on which his fame rests, though not published till after his death, is entitled *De Motu Animalium*, and in so far as it relates to mere animal mechanics properly so called, is full of interest and instruction; but when he attempts to apply his mathematical principles to the action of the heart, lungs, liver, and other viscera, he falls into egregious blunders, and stumbles at every step.

BORGHESE, a Roman family, which derives its origin from Sienna, and which held the highest offices in this republic from the middle of the fifteenth century. Pope Paul V., who belonged to this family, and ascended the papal chair in 1605, loaded his relations with honours and riches. In 1607 he appointed his brother, Francesco Borghese, leader of the troops sent against Venice to maintain the papal claims; bestowed the principality of Sulmone on Marco Antonio Borghese, the son of his brother Giovanni Battista; granted him a considerable revenue

and obtained for him the title of a grandee of Spain. Another of his nephews, Scipione Caffarelli, he created cardinal, and made him adopt the name of Borghese. From Marco Antonio Borghese, prince of Sulmona, is descended the rich family of Borghese.

BORGHESE, CAMILLO PHILIP LOUIS, formerly Duke of Guastalla, Prince of France, &c., was born in 1775 at Rome; died at Florence April 10, 1832. When the French invaded Italy he entered their service, and showed great attachment to the cause of France, in particular to General Bonaparte. In 1804 he became a French prince, and grand cross of the Legion of Honour, and at the breaking out of the war against Austria in 1805, commander of a squadron of the imperial guard. After its termination his wife received the duchy of Guastalla, and he was created Duke of Guastalla. After having served in 1806 in the campaign against the Prussians and Russians, and after having been sent to Warsaw to prepare the Poles for a revolt, the emperor appointed him governor-general of the provinces beyond the Alps. He fixed his court at Turin, and became very popular among the Piedmontese. After the abdication of Napoleon he broke up all connection with the Bonaparte family, and separated from his wife. The prince sold to the French government for the sum of 8,000,000 francs 822 works of art which ornamented the palace of his ancestors, known under the name of the *Villa Borghese*. Among them were several master-pieces: for example, the Borghese Gladiator, the Hermaphrodite, the Silenus, the Dying Seneca, Amor and Psyche. Bonaparte provided for the payment out of the national domains in Piedmont, which the King of Sardinia confiscated in 1815; at the same time, in consequence of the second invasion of France, the prince received back part of these treasures of art. In 1818 he sold Lucedio, in Savoy, for 3,000,000 livres. In the Kingdom of Naples he possessed the principalities Sulmona and Rosano. He was one of the richest Italian princes.

BORGHESE, MARIE PAULINE, Princess, the beautiful sister of Napoleon, was born at Ajaccio October 20, 1780. When the English occupied Corsica in 1793 she went to Marseilles, where she was on the point of marrying Fréron, a member of the Convention, and son of that critic whom Voltaire made famous, when another lady laid claim to his hand. The beautiful Pauline was then intended for General Duphot, who was afterwards murdered at Rome in December, 1797; but she bestowed her hand from choice on General Leclerc, then at Milan, who had been in 1795 chief of the general staff of a division at Marseilles, and had there fallen in love with her. When Leclerc was sent to St. Domingo with the rank of captain-general, Napoleon ordered her to accompany her husband with her son. She embarked in December, 1801, at Brest, and was called by the poets of the fleet, the *Galatea of the Greeks*, the *Venus Marina*. Her statue, in marble, as Venus, was made by Canova at Rome—a successful image of the goddess of beauty. She was no less courageous than beautiful, for when the negroes under Christophe stormed Cape François, where she resided, and Leclerc, who could no longer resist the assailants, ordered his lady and child to be carried on shipboard, she yielded only to force. After the death of her husband, November 23, 1802, she married at Morfontaine, in 1803, the Prince Camillo Borghese. Her son died at Rome soon after. With Napoleon, who loved her tenderly, she had many disputes and as many reconciliations, for she would not always follow the caprices of his policy. Yet even the proud style in which she demanded what her brothers begged made her the more attractive to

her brother. Once, however, when she forgot herself towards the empress, whom she never liked, she was obliged to leave the court. She was yet in disgrace at Nice when Napoleon resigned his crown in 1814, upon which occasion she immediately acted as a tender sister. Instead of remaining at her palace in Rome, she set out for Elba to join her brother, and acted the part of mediatrix between him and the other members of his family. When Napoleon landed in France she went to Naples to see her sister Caroline, and afterwards returned to Rome. Before the battle of Waterloo she placed all her diamonds, which were of great value, at the disposal of her brother. They were in his carriage, which was taken in that battle, and was shown publicly at London. He intended to have returned them to her. She lived afterwards separated from her husband at Rome, where she occupied part of the palace Borghese, and where she possessed, from 1816, the *Villa Sciarra*. Her house, in which taste and love of the fine arts prevailed, was the centre of the most splendid society at Rome. She often saw her mother, her brothers Lucien and Louis, and her uncle Feuch. When he heard of the sickness of her brother Napoleon, she repeatedly requested permission to go to him at St. Helena. She finally obtained her request, but the news of his death arrived immediately after. She died June 9, 1825, at Florence. She left many legacies, and a donation, the interest of which was to enable two young men of Ajaccio to study medicine and surgery. The rest of her property also left to her brothers, the Count of St. Leu and the Prince of Montfort. Her whole property amounted to 2,000,000 francs.

BORGIA, CESARE, the natural son of an ecclesiastic, who afterwards became Pope Alexander VI., and of a Roman lady named Vanozza. At a time when the court of Rome was a school of falsehood and licentiousness, and compacts and oaths afforded no security, he reduced crime to a system. Other princes have shed more blood, have exercised more atrocious cruelty, but his name is stigmatized with the greatest infamy; for with Borgia all was calculated with cool reflection. He profaned whatever was most holy for the attainment of his purposes. His father, who had become pope in 1492, invested him with the purple. When Charles VIII. of France made his entry into Rome Alexander was obliged to treat with him, and delivered Cesare Borgia into his hands as a hostage, who escaped, however, a few days after from the camp of the king. In 1497 Alexander bestowed the duchy of Benevento, together with the counties of Terracina and Pontecorvo, on his eldest son, who had already received from the King of Spain the duchy of Gandia. Cesare became jealous of his elevation, and when the Duke of Gandia was murdered, a week after his investiture, public opinion accused his brother Cesare of the deed. His father permitted him to lay aside the purple, and devote himself to the profession of arms, and sent him to France to carry to Louis XII. the bull for divorce and dispensation for marriage which he had long desired to obtain. Louis rewarded Borgia for the compliance of his father with the duchy of Valentinois, a body-guard of 100 men, and 20,000 livres a year, and promised to aid him in his projects of conquest. In 1499 Cesare married a daughter of King John of Navarre, and accompanied Louis XII. to Italy. He first undertook the conquest of Romagna, expelled the lawful possessors of the land, caused them to be treacherously murdered, and himself to be appointed by his father Duke of Romagna, in 1501. In the same year he wrested the principality of Piombino from Jacopo d'Apiano. He also endeavoured, though in vain, to make him-

self Duke of Bologna and Florence. In 1502 he announced that he was about to attack Camerino, and demanded for that purpose soldiers and artillery from Guidobaldo of Montefeltro, duke of Urbino. Camerino was taken by storm, and Giulio di Barona, the lord of the city, with both his sons, was strangled at the command of Borgia. This fate he prepared for all whom he had robbed. Those who did not fall into his hands he pursued with poison or the dagger. Meanwhile all the petty princes had united, and collected the soldiery for their defence; but Cesare Borgia terrified some by means of 3000 Swiss, whom he called to Italy, and gained over others by advantageous offers. Thus he dissolved their alliance, seized their lands, and saw no further obstacle to his being made, by his father, King of Romagna, of the March, and of Umbria, when Alexander VI. died, Aug. 17, 1503. At the same time Cesare Borgia was attacked by a severe disease, at a moment when his whole activity and presence of mind were needed. He found means, indeed, to get the treasures of his father into his possession, assembled his troops in Rome, and formed a closer alliance with France; but enemies rose against him on all sides, one of the most bitter of whom was the new pope, Julius II. Borgia was arrested and carried to Spain, where he remained for two years in prison. He at length made his escape to his brother-in-law the King of Navarre, went with him to the war against Castile, and was killed by a shot before the castle of Viana, March 12, 1507.

BORGIA, LUCREZIA, daughter of the infamous Pope Alexander VI., and sister of Cesare Borgia, when a mere child was betrothed to a gentleman of Aragon, but her father, on attaining the papedom, thought the match beneath her, and made no scruple of breaking the former engagement, and marrying her to Giovanni Sforza, lord of Pesaro. After she had lived with him for four years, Alexander, pretending to have discovered a cause of nullity, dissolved the marriage, and gave her to Alphonso, duke of Bisceglie, natural son of Alphonso II. of Aragon. Two years after this new husband was assassinated by the hired ruffians of Cesare Borgia. Lucreria, though she had three husbands, was now for the first time a widow; but not choosing to remain so, was, within the course of a year, married to Alphonso d'Este, son of Ercole, duke of Ferrara. Here she appears to have conducted herself more creditably than before, and became a liberal patroness of poets, who endeavoured to repay her benefactions by lauding her as the pattern of every virtue. It is very doubtful how far such eulogiums can outweigh the historical evidence which has been brought to prove her guilty of every species of enormous crime; but Roscoe and other more recent historians have endeavoured, with some success, to clear her reputation from the stains which have been cast on it. She died at Ferrara in 1523.

BORGIA, STEFANO, CARDINAL, born at Veletri in 1731, was brought up by his uncle, Alexander Borgia, archbishop of Fermo, and in 1760, on becoming a member of the Etruscan Academy of Cortona, commenced at Veletri to form a museum, which has since become one of the best private collections in existence. In 1769 he was appointed by Benedict XIV. governor of Benevento, and in 1770 he became secretary to the College of Propaganda, which brought him into immediate relation with missionaries to all parts of the world, and enabled him, at comparatively little expense, to enrich his museum with MSS., coins, statues, idols, and all the other rarities which each country possessed. In 1789 Pius VI. made him a cardinal, and at the same time appointed him inspector-general of the foundling hospital, into which,

if such an institution can be deemed either worthy or capable of improvement, he introduced extensive reforms. In 1797 the revolutionary spirit which had broken out in France extended itself to Rome, and the pope, as the best means of counteracting it, gave all his confidence to Borgia, and installed him as dictator. The situation was extremely difficult, but he showed himself worthy of the trust, and gained such ascendancy over the public mind that tranquillity and good order remained uninterrupted till 1798. By this time the French were at the gates, and the popular party, becoming dominant, established a republic. The pope was compelled to depart, and Cardinal Borgia, at first arrested, was ordered, on obtaining his liberty, to quit the Papal States. After disembarking at Leghorn he repaired to Venice and Padua, and continued regularly to discharge his functions in connection with the Propaganda as if nothing had occurred to interrupt them. He returned to Rome with the new pope, Pius VII., who treated him with the same confidence as his predecessor. Afterwards, when Pius VII. was carried off to France, Borgia was ordered to accompany him, and he accordingly set out, but had only reached Lyon when he was seized with a serious illness, and died in 1804. He was the author of several antiquarian and historical works, and deserves honourable mention for his liberal patronage of arts and artists.

BORGOGNONE, JACOPO CORREAI, born in 1621 at St. Hippolite in Burgundy, studied painting under his father, but enlisted in the army, and remained in it for three years. On his return he resumed his art, and went to Bologna, where he attracted the notice of Guido, and became an inmate in his house, where he made good use of the valuable opportunities of improvement thus afforded him. After realizing an independence he visited his native place. He, however, returned again to Italy, and after painting with much success resolved to become a Jesuit. He was accordingly admitted into the order at Rome in 1655, but he appears to have painted as diligently as ever. He died in 1676. He is remarkable for freedom of design, and the vividness with which his pictures bring the subjects which they represent before the mind. In his battle-field, for instance, the spectator not only sees the scene, but almost imagines himself in the very heart of it, hearing the cries and shrieks and the roaring of the artillery.

BORING is a species of circular cutting, in which a cylindrical portion of a substance is gradually removed. When tubes of metal are to be formed a cast is, in some cases, made in solid metal, and the whole of the bore is produced by the boring machine in others the cast is made hollow at first, and the borer is only used to give uniformity and finish to the inside of the tube. In boring cannon sometimes the tool is made to revolve while the cannon is at rest, and sometimes the cannon is made to revolve while the tool is at rest. By the latter arrangement the bore is said to be formed with more accuracy than by the other method of putting the borer in motion. The tool is kept pressed against the cannon by a regular force. Cylinders of steam-engines are cast hollow, and afterwards bored; but in this case the borer revolves, and the cylinder remains at rest. In either case the axis of the borer and that of the cylindrical material should coincide; for otherwise, if the borer revolve, it will perforate obliquely; if the material revolve, the perforation will be conical. In some of the more recent cylinder-boring machines the cylinder is kept perpendicular to the horizon, which seems to insure more accuracy than by the ordinary method. The instruments used are gimlets, augers, centre-bits, drills, &c. Drills are made to turn rapidly, either in one direction by means of a

lathe-wheel and pulley, or alternately in opposite directions by a spiral cord, which coils and uncoils itself successively upon the drill, and is aided by a weight or fly. See also *MISING*.

BORLASE, WILLIAM, born at Pendennis, near St. Just, in Cornwall, in 1696, studied at Oxford, entered into orders, and became successively rector of Ludgvan and vicar of St. Just. The richness of Cornwall in mineral products and antiquities gave a direction to his studies, and he began making collections with the view of afterwards giving a description of his native county. In 1750 he was elected a Fellow of the Royal Society, to which he had communicated a valuable paper on the spars and crystals of the Cornish mines, and for many years after he continued to write in its Transactions. In 1764 he published his *Antiquities of Cornwall*, and in 1768 he completed the work by publishing his *Natural History of Cornwall*. He died in 1772. He kept up a correspondence with the most eminent men of his day, and was on intimate terms with Pope, whom he furnished with materials for his *groto at Twickenham*. Dr. Borlase's name, formed out of *crystala*, is still to be seen there.

BORNEO (corrupted by the Portuguese from *Bruni* or *Brunei*, the name of a state on its north-west coast) is one of the islands of the Malay Archipelago, and next to Australia and New Guinea (but not much smaller than the latter), the largest island in the world. On the s. it has the Java Sea; on the e. the Strait of Macassar and the Sea of Celebes; on the n. the Sooloo Sea; on the w. and n.w. the China Sea. Its circumference is about 8000, its greatest length 780, and its greatest breadth 690 miles; area, according to recent calculation, 283,358 square miles. In former times only the coasts were known to Europeans, but of late years part of the interior has been explored by various travellers, of whom St. John, Wallace, and Burbridge may be named. There are several chains of mountains ramifying through the interior, the culminating summit (13,698 ft.) being *Kini-Balu*, near the northern extremity. In regard to the rivers, we have only a knowledge of the lower part of their course. They are very numerous and several of them are navigable for a considerable distance by large vessels. There are a few small lakes. In the districts on the coast the climate is hot and damp, yet in many places it is said to be not prejudicial to Europeans. Mr. Crocker, for instance, after sixteen years' residence reports the climate of Sarawak as 'very healthy for Europeans' (*Proceedings R. Geog. Soc.*, April, 1881). The rainy season lasts, on the w. coast, from November to May, and the thermometer, in the s., ranges from 82° to 98° Fahr. Borneo contains immense forests of teak and other trees, besides producing various dyewoods, and such products of the jungle as camphor, rattans and other canes, gutta-percha and india-rubber, honey and wax, &c. Its fauna comprises the elephant, rhinoceros, leopard, buffalo, deer, monkeys (including the orang-outang), and a great variety of birds. The mineral productions consist of gold, antimony, iron, tin, quicksilver, zinc, and coal, besides diamonds. It is only portions of the land on the coast which are well cultivated. Among cultivated products the chief is sago, large quantities of which are exported; others are gambier, pepper, rice, tobacco, &c. Edible birds'-nests and trepang are important articles of trade. The population of the island is roughly estimated at about 1,760,000. They are divided into Malays, Dyaks, Chinese, and Bugis. The Malays are the predominating and most cultivated race on the sea-coast, and form a number of more or less independent states. The Dyaks are a finely-formed race, of a yellow complexion, but savage and cruel. They

are divided into a great number of tribes, living partly on the coast, partly inland. The immigrant Chinese, numbering about 250,000, devote themselves to trade and mining. Lastly, the Bugis, chiefly immigrants from Celebes, live on the coast, and have become rich and powerful by commerce.

The south-western, southern, and eastern portions of the islands, or about two-thirds of the whole, are possessed by the Dutch, under whom are a number of semi-independent princes. The Dutch have long had settlements in Borneo, but have done little to develop the resources of the island. On the n.w. coast is the Malay kingdom of Borneo or Bruni, sometimes called Borneo Proper, which has recently been put under British protection. Its chief town is Bruni or Borneo, on the river of the same name, a place of considerable trade, principally with Singapore, and the residence of the sultan. In former times, the Kingdom of Borneo appears to have extended over the whole island and a part of the Philippines, and its monarchs are said to have been of Chinese origin. Since 1841 there has been a state under English rule (though not under the British crown) on the w. coast of the island, namely, Sarawak (which see), founded by Sir James Brooke, while Labuan, an island off the n.w. coast, is a British colony. Recently an English commercial company, with a charter from the British government, has acquired sovereign rights over the northern portion of the island, from Sipitong on the west coast to Sibuko River on the east, this territory (called North Borneo or Sabah) being granted in 1877-78 in perpetuity by the Sultans of Bruni and the Sooloo Islands, and another native prince, subject to annual payments. North Borneo has an area of about 31,000 sq. miles (a fourth more than Ceylon), several splendid harbours, a fertile soil, and a good climate. When its resources are utilized it will no doubt prove a valuable acquisition. At present the population is sparse, and a large part of the territory consists of virgin forest. Much of the soil is of undoubted fertility, and is believed to be well adapted for coffee, sago, taploca, sugar, tobacco, cotton, &c. Probably there are valuable mineral deposits also. In the territory are caves in which the swallows build numerously that produce the edible nests. Already a considerable quantity of land has been taken up, chiefly for the cultivation of tobacco. A number of Chinese immigrants have been introduced. The chief settlement and seat of government is Sandakan on Sandakan Harbour. For further particulars of this British possession, see *BORNEO, BRITISH NORTH*, in *SUPP.*

BORNHOLM, a Danish island in the Baltic Sea, nearly surrounded with rocks; lon. 15° e.; lat. 55° 10' n.; about 24 miles long, and 16 broad; pop. 35,364. It is stony but fertile; yields oats and butter; has excellent pastures; and also mines of coal, marble quarries, and fisheries. The island has long been famous for its rock-crystals.

BORNOU, a kingdom of Central Africa, lying between 10° and 15° n. lat., and 12° and 16° 30' e. lon., is bounded n. by Kanem and the desert, e. by Lake Tchad, s. by Mandara, and w. by Soudan. From March to July the heat is extreme, the thermometer rising to 107°, and rarely falling below 86° Fahr.; during this time scorching winds from the s. prevail. As in other tropical countries, the seasons are divided into the dry and rainy: the latter continues from March to October, when the air becomes milder and fresher. The country is populous, containing thirteen principal towns. These are generally large and well built, with walls 40 feet high, and about 20 feet thick. The houses consist of several courtyards, with apartments for slaves, habitations for the different wives, and several turrets con-

neated by terraces, forming the apartments of the owner. The Bornou people, or Kanuri, have negro features; they are peaceable and industrious, practising agriculture and various mechanical arts. The government is an absolute monarchy, with certain constitutional forms, and the sultan or *mai* can, it is said, muster a well-equipped army of 25,000 or 30,000 men, partly cavalry, armed with musket, rifle, sabre, &c. Indian-corn, cotton, and indigo are the most valuable productions of the soil. Fruits and vegetables are also raised. The domestic animals are asses, camels, horses, dogs, sheep, goats, and oxen. Lions, leopards, hyenas, jackals, elephants, and buffaloes roam the forests. The crocodile and hippopotamus are considered a luxury. The ostrich, pelican, crane, and guinea-fowl abound. Locoats often appear in great clouds, and are eaten by the natives. The capital is Kuka, near the shore of Lake Tchad. Bornou is now included in Northern Nigeria. Estimated pop. 5,000,000.

BORODINO, BATTLE OF (called by the French battle of the Moskwa), was gained by Napoleon, September 7, 1812, over the Russians under Kutusoff. See NAPOLEON.

BORON. See BORACIC ACID.

BOROUGH (Anglo-Saxon *burg* or *burh*), originally a fortified town, now a town with a corporation or municipality of its own. In England the term was early restricted to those towns which sent representatives to Parliament. Up to the reform act of 1832 many places formerly populous, and entitled to separate representation, though reduced to two or three houses, continued to retain their original privilege. These were called *rotten boroughs*. (See PARLIAMENT in art. BRITAIN.) The term borough is also applied to a corporate town, though it may not send a member or members to Parliament, and thus boroughs are divided into parliamentary and municipal boroughs. There are now also county boroughs, or boroughs forming counties in themselves; but many boroughs are at once parliamentary, municipal, and county boroughs. The earliest English municipal boroughs had their privileges fixed by royal charters, some of which date from pre-Norman times. The great transformation in the relative importance of different parts of the country, and the development of large towns, which were due to the growth of manufactures, produced many striking anomalies in municipal government. Many trifling villages, once places of importance, were regularly incorporated and had the full number of municipal officers, whilst great centres of population had no proper borough officers, but only paving and other commissioners appointed by the central government. Moreover, many of the boroughs in the beginning of the nineteenth century had special peculiarities and features distinguishing them from other corporate towns. All such anomalies were swept away by the Municipal Corporations Act of 1835, which, with all amending acts, is now superseded by the comprehensive act of 1882. Under this act every municipal borough is governed by a corporation consisting of a mayor, aldermen, and town-council. The council is elected by ballot by the burgesses, and it in turn elects the mayor and the aldermen. The burgesses entitled to vote are all resident householders who have occupied and paid rates for twelve months prior to any July, and had their names inscribed on the roll of burgesses. Females, though excluded from the parliamentary franchise, are, if otherwise qualified, entitled to vote in town-council elections. The election of councillors takes place every first of November; the term of office is three years, one-third retiring annually. The aldermen, in number one-third of the councillors, are elected for six years,

one-half retiring every third year. The mayor's term of office is one year, and he may be elected from among aldermen, councillors, or persons qualified to be such. Aldermen and councillors always, and mayors often, serve gratuitously. This corporation is entrusted with the management of the corporate property, and appoints a town-clerk, a treasurer, and other officials. It controls the borough police, and acts as urban sanitary authority under the Public Health Acts. Where there is no school-board the council acts as a school attendance committee. Corporations may also promote bills in Parliament. Most large boroughs have a separate commission of the peace (justices of peace for themselves), also a court of quarter sessions presided over by a recorder (city judge), and boroughs not possessing these may obtain them by petitioning the crown. Boroughs with a separate peace commission have also a borough coroner. The mayor and ex-mayor are justices of the peace *ex officio*. Borough magistrates are appointed by royal commission, and are usually unpaid; but in some of the larger boroughs a stipendiary magistrate (as well as the salaried recorder) has been appointed by the crown on the application of the council. The expenses of administration are defrayed out of the *borough fund*, that is, the revenues derived from the rents and produce of the lands, houses, &c., belonging to the corporation, as also from fines; but if necessary (and it is rarely unnecessary) this is supplemented by a *borough rate*. For county boroughs see LOCAL GOVERNMENT. For the Scotch boroughs, or rather *burghs*, see BURGII.

BORRAMEAN ISLANDS, four small islands in a bay of Lago Maggiore, North Italy, belonging to the Borromeo family, and named respectively Isola Bella, Isola Madre, Isola dei Pescatori, and L'Isolino. The Isola Madre lies farthest from the shore of the lake. It is laid out in seven terraces, rising one above the other, with charming walks and a mansion on the top. The Isola Bella contains a handsome and extensive palace, with private chapel and picture gallery, the fine gardens adjoining being laid out upon ten terraces rising above each other. The island was formerly little more than a barren rock and much soil required to be brought from the mainland. The Isola dei Pescatori is mostly occupied by a fishing village. Magnificent views of the surrounding scenery are obtained from these islands.

BORRAMEO, CARLO, COUNT, a celebrated saint and cardinal of the Roman Church, was born Oct. 2, 1538, at Arona, on Lago Maggiore; studied the law at Pavia; was in 1559 made doctor, and in 1560 was successively appointed by his uncle Pius IV. apostolical protonotary, referendary, cardinal, and Archbishop of Milan. As legate over Romagna, the March of Ancona and Bologna, he had a great share in the civil government: as protector of Portugal, of the Netherlands, of Switzerland, of the Franciscans, Carmelites, and of the Knights of Malta, he administered several important branches of the spiritual government of the pope, who created him his grand penitentiary, and did nothing of importance without his advice. The re-opening and the results of the Council of Trent, so advantageous to the papal authority, were chiefly effected by the great influence of Borromeo. He did much for the embellishment of the papal buildings, employing even his own fortune for that purpose, and established many excellent institutions as Archbishop of Milan; improved the discipline of the clergy, founded schools, seminaries, an order of secular priests (oblates), libraries, hospitals, and was indefatigable in doing good. During the pestilence which raged in Milan in 1576 he distinguished himself by his

heroic devotion to his flock. As soon as the scourge appeared in the city, he hastened from a distant part of his diocese, where he was making a pastoral visitation, and spent all his energies in giving bodily aid and spiritual consolation to the plague-stricken inhabitants. All his virtues, however, could not save him from persecution and calumny: he was even severely attacked by the government, but no charge could be proved against him. He died Nov. 3, 1584, at the age of forty-six. Miracles were immediately said to be wrought at his tomb, and his canonization took place in 1610.—His nephew, COUNT FEDERIGO BORROWEO, was equally distinguished for the sanctity of his life and the benevolence of his character. He was born at Milan in 1564, and died in 1631. Like his uncle he was also cardinal and Archbishop of Milan. He is celebrated as the founder of the Ambrosian Library (which see). When Milan was desolated by a pestilence in 1630, Federigo showed the same heroism as his uncle Carlo had done during that of 1576.

BORROW, GEORGE, traveller, linguist, and writer on gypsy life, was born at East Dereham, Norfolk, in 1803. On his father's side he was descended from a Cornish family, and his mother was of French extraction. His father was a recruiting officer who constantly changed his residence, and thus Borrow's early years were passed in various parts of the United Kingdom. He received part of his education in Edinburgh High School, and in 1820 was articled to a Norwich solicitor. It was about this time that he laid the foundation of his linguistic knowledge under the guidance of William Taylor, a friend of Southey. After his father's death he went to London, where he earned his livelihood by literary hackwork; but soon tiring of this he set out on a series of journeys through England, France, Germany, Russia, and other countries, acting latterly as agent of the British and Foreign Bible Society and correspondent of the *Morning Herald*. During the seven years or so prior to his engagement by the Bible Society he seems to have suffered great privations, but of his movements at that time he has told us nothing. He married in 1840, and settled on a small estate of his wife's at Oulton Broad, in the north-east of Suffolk, and there he died in August, 1881. He maintained to the last his strong sympathy for gypsy life, and not only permitted but encouraged the gypsies to encamp on his estate. His best-known work is his *The Bible in Spain* (3 vols. 1843); and his other publications include *Targum, or Metrical Translations from Thirty Languages and Dialects* (1835); *The Zincoli, or an Account of the Gypsies in Spain* (1841); *Lavengro, the Scholar, the Gypsy, the Priest* (1851), a sort of idealized autobiography; *The Romany Rye, a sequel to Lavengro* (1857); *Wild Wales, its People, Language, and Scenery* (1862); and *Romano Lavo-Lil* (1874), a dictionary of the gypsy language. Borrow was a strong, manly character, delighting in the free, open-air existence of the gypsies whose life he knew so well, and despising heartily all affectation and false gentility. His later works, by their outspokenness, lost him much of the reputation earned by his Bible in Spain. See the *Life, Writings, and Correspondence* by Dr. Knapp (2 vols., 1899).

BORROWSTOUNNESS (popularly pronounced and now often written *Borness*), a town in Linlithgowshire, Scotland, distant 17 miles W. by N. of Edinburgh. It is situated on a low peninsula, washed by the Forth, and possesses three principal streets running from W. to E., one of them a continuation of the other two. The chief industrial establishments are potteries, iron-foundries, engineering shops, chemical manure works, saw-mills, timber yards,

coal and coke works, distilleries, brick-fields, &c., and in the vicinity are very extensive collieries. A new dock has recently been constructed and the old harbour improved, hydraulic hoists and other appliances being provided. There is a large trade in coal, iron, timber, &c., and fishing is also carried on. The wall of Antoninus ran through the parish of Borrowstounness, and traces of it called *Graham's Dyke* are still visible on the east bank of the Avon. Pop. of the town in 1871, 4256; in 1891, 5866; in 1901, 9100.

BOSA, a seaport on the west coast of Sardinia, built partly on the side of a hill crowned by an old castle, and partly in an unhealthy plain. It has a cathedral and other churches, a theological seminary, and is the residence of a bishop, suffragan to the Archbishop of Sassari. Pop. 6500.

BOSCAN ALMOGAVER, JUAN, a Spanish poet, born towards the close of the fifteenth century, at Barcelona; died about 1540. His parents, who belonged to the most ancient nobility, gave him a careful education. He followed the court of Charles V. and in 1526 was attached to it for some time in Granada. His noble manners and character gained him the favour of the emperor, and the education of the Duke of Alva was committed to him. After his marriage Boscan lived at Barcelona, occupied in publishing his works, together with those of his deceased friend Garcilaso, in which he was employed at the time of his death. Boscan first introduced Italian measures into Spanish, and thus became the creator of the Spanish sonnet. His poems are still esteemed, the best edition being that published at Madrid in 1875.

BOSCAWEN, HON. EDWARD, a British admiral, was born in 1711, and was a son of Viscount Falkmouth. Having entered the navy he distinguished himself at Porto Hello (1740) and Cartagena (1741), where he stormed a battery at the head of a part of his crew. In 1744 he was promoted to the *Dreadnought*, a 60-gun ship, in which he took the French frigate *Medea*. Three years afterwards he signalized himself under Anson, at the battle of Cape Finisterre. Towards the close of this year he was appointed commander-in-chief by sea and land in the East Indies, and was despatched there with a squadron. He failed in attempts on Mauritius and Pondicherry, and in 1750 returned to England, where he obtained a seat at the Admiralty Board. In 1755 he became vice-admiral and sailed for North America, and in an action with a French squadron two ships of the line fell into his hands. It was he who signed the immediate order for the execution of Byng in 1757. In 1758 he was promoted to the rank of admiral of the blue, and in conjunction with Lord Amherst, who commanded the land forces, he was present at the capitulation of Louisbourg. The year following, having then the command in the Mediterranean, he pursued the Toulon fleet, under De la Clue, through the Straits of Gibraltar, and coming up with it in Lagos Bay, completely defeated it, burning two ships and taking three. For these services he received the thanks of Parliament and £3000 a year, with the rank of general of marines, in 1760. He died in the following year at his seat in Surrey.

BONCH, BALTHAZAR VAN DEN, a painter, born at Antwerp in 1681. The first work which brought him into notice was an equestrian picture of the Duke of Marlborough, executed in concert with Van Bloemen, who painted the horse. He was afterwards employed on a number of works, for which he is said to have received as high prices as Teniers or Ostade; and a short time before his death in 1715 was appointed director of the Academy of Antwerp.

BOSCOBEL, a parish in Shropshire, England, unimportant in itself, but remarkable historically as

the hiding-place of Charles II. for some days after the battle of Worcester, Sept. 3, 1651. Boscobel House belonged at the time to a staunch royalist, and as it was judged a convenient place of retreat, Charles at once proceeded in that direction, and hid himself during the day in the thickest part of the wood. After making one attempt to escape from England through Wales, he was compelled to return again to his former hiding-place, and concealed himself among the branches of a pollard oak in Boscobel Wood, where it is related that he could actually see the men who were in pursuit of him, and hear their voices. The 'royal oak' which now stands at Boscobel, is said to have grown from an acorn of this very tree. An account of Charles's adventures after the battle of Worcester was published in 1662, with the title, *Boscobel, or the Compleat History of his Sacred Majesty's most Miraculous Preservation after the Battle of Worcester*. The author of this history is not known with certainty, but it is said to have been the work of Thomas Blount. Anthony Wood, the author of *Athenae Oxonienses*, says of it that it is 'penned with great truth and fidelity'.

BOSCOVICH, ROGER JOSEPH, an astronomer and geometriean of distinguished eminence in the eighteenth century, was born at Regusa, in Dalmatia in 1711. He was educated among the Jesuits, and entering into their order, was appointed professor of mathematics in the Roman College, before he had entirely completed the course of his studies. He was employed by Pope Benedict XIV. in various undertakings, and in 1750 began the measurement of a degree of the meridian in the Ecclesiastical States, which operation occupied him for two years. He afterwards visited the Pontine Marshes, to give advice respecting the draining of them. He was then intrusted by the Republic of Lucca with the defence of its interests, in a dispute about boundaries with the government of Tuscany. This affair obliged him to go to Vienna, and having terminated it with success, he visited Paris and London. He was elected a Fellow of the Royal Society, and dedicated to this body a Latin poem on eclipses. Returning to Italy, he was appointed mathematical professor in the University of Pavia; whence, in 1770, he removed to Milan, and there erected the celebrated observatory at the College of Brera. On the suppression of the order of Jesuits, he accepted an invitation to France from Louis XV., who gave him a pension of 8000 livres, with the office of director of optics for the navy. This appointment induced him to pay particular attention to that part of optical science which treats of the theory of achromatic telescopes, on which subject he wrote a treatise of considerable extent. He was obliged to leave Paris in 1783, on account of ill health, when he retired to Milan, where he died, Feb. 12, 1787. An edition of the works of Father Boscovich was published by himself at Bassano, in five vols. 4to, 1785. His *Theoria Philosophiæ Naturalis reducta ad Unicam Legem Virium in Natura Existentium*, first published in 1758, is a curious production, containing speculations of which Dr. Priestley availed himself in his writings in favour of materialism.

BOSHMEN, or **BOSHEMEN**. See **BUSHMEN** and **HOTTENTOTS**.

BOSNA-SERAJ, **SERAJ**, or **SERAJEVO** (ancient *Theropolis*), capital of the province of Bosnia, now occupied by Austria, situated on the Miglizza, which is here crossed by a handsome stone bridge, 120 miles s.w. of Belgrade, and 670 miles w.n.w. of Constantinople. It is well built, and although most of the houses are of wood, has a gay and pleasant appearance, from the number of towers and minarets with which it is embellished. Many improvements have been

introduced since the Austrian occupation. It contains a *serai* or palace, built by Mohammed II., to which the city owes its name; many mosques, great and small; churches, monasteries, two large bazars, schools, baths, and charitable institutions. It was formerly surrounded with walls, but these are now completely decayed; and its only remaining defence is a citadel, built on a rocky height at a short distance π from the town, mounted with cannon. Serajevo is the chief mart in the province, the centre of commercial relations between Turkey, Austria, and South Germany; and has, in consequence, a considerable trade. The people are industrious, and manufacture arms and utensils of copper; ironware, woollen and worsted stuffs, morocco leather, cottons, &c. There are also several tanneries in the city, and at a short distance from it several important iron mines; and on a plain which stretches to the w. the baths of Serajevesko. Pop. in 1855, 26,286.

BOSNIA, a Turkish province in the north-west of the Balkan peninsula, to the west of Servia, occupied, by the terms of the Treaty of Berlin (1878), by Austrian troops, and to be administered for an undefined future period by the Austrian government. It comprehends, besides the ancient Bosnia, part of Croatia, a tract of Dalmatia, and Herzegovina, and contains from 23,000 to 24,000 square miles (of which Bosnia Proper occupies 16,200), with (1838) 1,404,000 inhabitants, mostly of Slavonian origin, and comprising Bosniaks, Servians, Morlaks, and Croats, besides Turks, Greeks, Jews, Gypsies, &c. The Bosniaks are the most numerous. They are partly Mohammedans, partly Roman and Greek Catholics. The Servians and Croats are next in point of number. The country is level towards the n.; in the s., mountainous and woody. Its chief rivers are the Save, the Verbas, the Bosna, Rama, and Drina. Bosnia contains fertile fields, orchards, and vineyards; the breed of cattle is excellent, and the mountains furnish good iron, of which a great part is manufactured in the country into guns and blades. The other articles manufactured are leather, morocco, and coarse woollen cloths. In the twelfth and thirteenth centuries Bosnia belonged to Hungary. In 1339 it fell into the hands of Stephen, king of Servia. After his death it remained independent, and the Ban Twartko took the title of king in 1370. In 1401 it became tributary to the Turks, and since 1463 has been a Turkish province. It is divided into the southern and northern parts, or Upper and Lower Bosnia. The former is commonly called Herzegovina (which see). The capital of Bosnia is Bosna-Seraï (which see); Zvornik, Banyaluka, Mostar, and Travnik are also important places. The Bosniaks are boorish in their manners and uncourteous towards strangers, but industrious and temperate. The women, like the men, are well and strongly made, and mostly good-looking. The Bosniaks are fond of hunting and fishing, and engage to some extent in agriculture and cattle-rearing. Servian is the language generally spoken. Bosnia has often attempted to throw off the Turkish yoke, and after the Russo-Turkish war of 1877-78, which was led up to by an insurrection in Herzegovina and Bosnia, the provinces were with the consent of the great powers occupied by Austria. **BOSPORUS**, or **BOSPHORUS** (that is, *Os-ford*), the strait, 19 miles long, joining the Black Sea with the Sea of Marmora, called also the Strait of Constantinople. It is defended by a series of strong forts, and by agreement of the European powers no ship of war belonging to any nation shall pass the strait without the permission of Turkey. The shores of the Bosphorus are elevated and the scenery picturesque. Over this channel (about 3088 feet wide) Darius constructed a bridge of boats, on his expedition against

the Scythians. The *Oimmerian Bosphorus* was the name given by the ancients to the strait that leads from the Black Sea into the Sea of Azov, now the strait of Kaffa or Yenikale, the other Bosphorus being distinguished as the *Thracian Bosphorus*. There was anciently a Greek kingdom of the name of Bosphorus, so called from the Oimmerian Bosphorus, on both sides of which it was situated. The capital of this kingdom was Panticapæum (represented by the modern *Kertch*), in the *Tauric Chersonese*, the ancient name of the Crimea. This kingdom was founded about a.c. 480. Spartacus was among the first kings. Under a successor, Satyrus, the kingdom was extended to the coast of Asia, and his son Leucon farther extended it. He improved the commerce of the country (in particular by the exportation of corn to Athens, also of fish, fur, skins, bees' wax, and slaves). From him his descendants were called *Leuconides*. Leuconor became tributary to the Scythians a.c. 290, and the tribute was finally so oppressive that Parisades, the last of the Leuconides, preferred to submit to Mithridates, the king of Pontus, who vanquished the Scythians under Scyllurus a.c. 116, and made his son King of Bosphorus. At the death of Mithridates (see *MITHRIDATES*) the Romans gave the country, a.c. 64, to his second son, Pharnaces, who was afterwards murdered. The Romans placed different princes successively upon the throne, who all pretended to be descendants of Mithridates. When this family became extinct, a.d. 259, the Sarmatians took possession of the kingdom, from whom it was taken by the Chersonesians in 344. The Tauric Chersonese then belonged to the Eastern Empire, till it was seized by the Chazars, and afterwards by the Tartars, under the Mongol princes. See *TAURIDA*.

BOSSUET, JACQUES BÉNIGNE, Bishop of Meaux, an illustrious French preacher, was born at Dijon on Sept. 27th, 1627, and early sent to the college of the Jesuits there. By chance he got possession of a Latin Bible, which made an indelible impression upon him. At the age of fifteen he was sent to Paris, where he entered the College of Navarre, the president of which, Nicholas Cornet, took pleasure in forming his mind. Bossuet, under the direction of this worthy teacher, studied Greek and the Holy Scriptures, read the ancient classics, and investigated the Cartesian philosophy. He was made Doctor of the Sorbonne and canon in Metz. Here he edified his hearers by his preaching and example; was commissioned by his bishop to refute the catechism of the Protestant minister Paul Ferry, and did it in such a way that even his antagonists were obliged to respect him. The queen-mother (Anne of Austria) was induced, by this work, to employ Bossuet in the conversion of the Protestants in the diocese of Metz. This business often called him to Paris, where his sermons met with great approbation. The sermon which he delivered in 1668, on the occasion of Marshal Turenne's joining the Roman Church, procured him the bishopric of Condom. In 1670 the king charged him with the education of the dauphin. In consequence of this appointment he resigned his bishopric in 1671, because he thought it inconsistent with his duty to retain it during a continual absence from his diocese. At this time he delivered his sermon at the funeral of Madame the Duchess of Orleans—a princess who, in the midst of a brilliant court, of which she was the ornament, died suddenly in the bloom of youth. His last sermon of this kind (that at the tomb of the great Condé) is considered as a master-piece. The manly vigour which characterized his orations is seen also in the *Discours sur l'Histoire Universelle*, designed for the instruction of his royal pupil. The care which he took of the education of this prince was rewarded in 1680 by the

VOL. II.

office of the first almoner of the dauphin; in 1681 by the bishopric of Meaux; in 1697 he obtained the dignity of a councillor of state, and a year afterwards that of the first almoner of the Duchess of Burgundy. His practice and his doctrine were equally severe. All his time was divided between his studies and the execution of his official duties; he seldom allowed himself any recreation. The last years of his life he passed among his flock, in the midst of whom he died on April 18th, 1704. The learned Benedictines of the brotherhood of St. Maur published a complete edition of the works of Bossuet in forty-three vols. 8vo (Versailles, 1815–19). Bossuet was unrivalled as a pulpit orator, and greatly distinguished for his strength and acumen as a controversialist. Among the most celebrated of his works are his *Oraisons Funèbres*, *Histoire des Variations des Églises Protestantes*, and *Politique tirée des propres Paroles de l'Écriture Sainte*. The French Academy consider him among their most renowned members. He has described his own life at length. (For his dispute with the Archbishop of Cambrai, Fénelon, see *FÉNELON* and *QUIETISM*.)

BOSSUT, CHARLES, an eminent mathematician, born at Tartaras, in the department of the Rhône, on Aug. 11th, 1780, was educated at the Jesuit College, Lyons, and having met with the *Éloges* of Fontenelle, was smitten with so eager a desire to imitate the distinguished individuals therein described, that he wrote to Fontenelle himself on the subject. That veteran, now ninety years of age, not only answered the letter, but expressed such an interest in the future progress of his young correspondent, that Bossut repaired to Paris, and was introduced by Fontenelle to Clairaut and D'Alembert, the latter of whom he appears to have particularly admired and studied to imitate. In 1752 he was appointed professor of mathematics to the school of Mézières, and held that office for sixteen years, during which he gained several prizes offered by the Academy of Sciences. He was afterwards admitted a member of that body, and was at the same time appointed examiner of candidates for the artillery and engineers. At the revolution he was deprived of all his appointments, and afterwards lived in retirement till his death on Jan. 14th, 1814. His most important works are a *Course of Mathematics*, which was long in repute as a text-book; a *Treatise on Hydrodynamics*; the *Introductory Discourse to Mathematics*, and various other articles in the *Encyclopédie*; and a *History of Mathematics*. He also edited the works of Pascal.

BOSTON, a municipal and parliamentary borough and port of Lincolnshire, England, situated on the river Witham, about 5 miles from the sea, 82 s.e. from Lincoln. It derived its name (a corruption of Botolph's town) from St. Botolph, who founded a monastery here about the year 660. The port had formerly a flourishing trade, but owing to various causes, and especially the fact that in dry seasons the river became choked up with sand brought in by the tides, this trade greatly declined. In 1881 a new channel was constructed so as to bring the town within 3 miles of the sea by navigable water; and a new dock of seven acres area, capable of admitting vessels of 3500 tons at the highest tides, was opened three years later. Boston contains some fine buildings, notably the parish church of St. Botolph, the Cotton chapel, and various other places of worship, a grammar-school dating from 1564, the Athenæum, the Guildhall, and the Assembly-rooms, under which are arranged the butter-market, poultry-market, and the police-station. St. Botolph's Church is a very large and handsome Gothic structure, with a tower, known as Boston Stump, 282 feet high, containing a

carillon of 36 bells cast at Louvain. In the upper part of the tower, octagonal in shape, lights used to be suspended for the guidance of mariners at sea and travellers crossing the fens by night. The town is now well supplied with water brought from a reservoir distant about 14 miles. The leading industries comprise iron and brass foundries, the manufacture of farm implements, sails, ropes, and bricks, and tanning, brewing, and malting. Fishing also gives occupation to many of the inhabitants, and there is steam communication with Hamburg, Hull, and London. pop. of mun. bor. in 1891, 14,570; of parl. bor., 18,711; in 1901, 15,667 and 20,456 respectively.

BOSTON, a city of the United States, capital of Massachusetts, in Suffolk County, lies 232 miles N.E. from New York, 300 S.E. Montreal, 300 N.E. Philadelphia, 432 N. Washington; lon. $71^{\circ} 3' 30''$ W.; lat. $42^{\circ} 21' 27''$ N. Pop. in 1890, 448,470; in 1900, 560,892. It is situated at the bottom of Massachusetts Bay, at the mouth of Charles River, and stands principally on a small elevated peninsula, $2\frac{1}{2}$ miles in length and 1 in breadth, being connected with the continent by a narrow neck of land and several bridges. The present city includes, besides the town proper, the districts of South Boston (annexed 1804), East Boston, Roxbury (1868), Dorchester (1870), Charlestown (1874), West Roxbury (1874), and Brighton (1874). It has a capacious harbour of sufficient depth for the largest ships of war to enter safely and lie at anchor, protected from storms by a great number of islands, several of which are fortified. The bridges, with few exceptions, are of wood. That which leads from Boston to Cambridge is 3483 feet in length, and is supported by 180 piers. The Western Avenue, so called, leading across the bay, from the western part of the city to Roxbury, is 8000 feet long, and is formed of solid earth, supported on each side by stone walls. It serves both as a bridge and as a dam, by means of which and a cross dam two large basins are formed, one filled at every flood-tide, and the other emptied at every ebb, whereby a perpetual water-power is created for driving mills and machinery. This dam was built at a cost exceeding £135,000. The streets are mostly narrow and irregular in the older parts of the town, but in the newer part there are many fine spacious streets. Great improvements have been made, within a few years, in the general appearance of the city, by the widening and repaving of streets, the erection of new and elegant buildings, and the embellishment of the public grounds. Washington Street, running from the heart of the town proper south-west through Roxbury, is the main thoroughfare; parallel to it on the west side is another long street known as Tremont Street. The principal public square is the Common, which with the Mall, a gravelled walk around it, covers about 50 acres. It is a handsome piece of ground, partly shaded by elms and other trees, and is surrounded by some of the most elegant buildings in the city. Beside it is the public garden of 24 acres. The wharfs are in general spacious, and afford ample accommodation to shipping; and store-houses for merchandise. Long Wharf is 1800 feet, and Central Wharf 80 feet long. The wharfs and many of the streets have been made by raising the ground formerly covered by the tide. A great part of the buildings are of brick, four stories high; but many are of granite. The principal public buildings include the state-house, which is of brick, situated on the highest part of the city; the county court-house, which is of stone; Faneuil Hall, named from a citizen who presented it to the city in 1742, used for town meetings and political assemblies, and famous historically as the place in which the Americans were roused by their orators to resistance against the

British, hence sometimes called the Cradle of Liberty; the city-hall, and the old state-house, now used as public offices; the splendid granite custom-house, of Grecian architecture; the merchants' exchange; the institute for the blind, the Massachusetts general hospital, and the Faneuil-hall market; numerous places of worship, many of them handsome and imposing structures, the new Roman Catholic Cathedral and Trinity Church being among the most splendid buildings of the kind in the United States; many school-houses, some among them regarded as models of their kind; a county jail; a music-hall containing an organ remarkable for the beauty of its tone; several theatres, and a Grand Opera House.

There are over 300 primary, about 30 grammar, and 4 high schools, besides evening schools for adults. The expense of supporting the schools is about £2,000,000 (£400,000) a year. They are managed by a school-board. The principal literary institution here is Harvard University, founded in 1638, and situated at Cambridge, 3 miles from the city. (See CAMBRIDGE.) The medical branch of this institution is established in Boston. The Boston Athenæum has two large buildings—one containing a library, and the other a picture-gallery, a hall for public lectures, and other rooms for scientific purposes. There are many literary, scientific, and charitable societies in Boston. Among the former are the American Academy of Arts and Sciences, the Historical Society, the Massachusetts Medical Society, the Mechanics' Institution, and the Female College. Among the latter are the Humane Society, the Boston Dispensary, by which the poor are furnished with medical attendance and medicine free of expense; the female orphan asylum; the boys' asylum; and several others. A prominent feature in Boston is the number of good libraries. The most important of these is the Public Library, founded in 1852, which contains about 560,000 vols.; the State Library has 50,000 vols.

The pursuits of the inhabitants are in a great measure mercantile. They carry on an extensive home and foreign trade, and own many ships, which are employed not only in the importing, exporting, and coasting trade, but in trade between foreign markets. They are also largely engaged in the fisheries. The exports in 1897 were valued at £20,838,338; the imports at £17,137,630. The British shipping entered comprised 1620 vessels of 1,479,739 tons burden. Many kinds of manufactures are carried on here, one of the principal being that of boots and shoes. The capitalists of Boston are also the principal proprietors in joint-stock manufacturing companies established in various towns of the neighbourhood. Although Boston may be regarded as the cradle of the American newspaper press, since the first American newspaper, the *Nowaletter*, was set up here in 1704, the newspapers of Boston do not at present occupy a very high rank among those of the United States. On the other hand, the book-trade of the city is important, and some of the periodicals are conducted with great ability, and are extensively circulated.

Boston was founded in 1630 by some English emigrants, and was called by them at first Trimountain, from the three heights on which the first settlements were made. It received its present name in honour of an English clergyman, John Cotton, who was a native of Boston in Lincolnshire, and emigrated to this city. In the American War of Independence, Boston, which had already placed itself among the foremost in resisting the mother country, played an important part. The first decisive steps were taken here; and in the neighbourhood the battle of Bunker's Hill was fought June 17, 1775. Boston also took

a prominent position in the movement directed towards the abolition of slavery. In 1782 a great fire laid 60 or 70 acres of the city in ashes. Benjamin Franklin was born here in 1706.

BOSTON, THOMAS, a popular Scottish divine and doctrinal writer, was born at the town of Duns in 1677, and received his education at the University of Edinburgh. In 1699 he was ordained minister of the parish of Simprin (now in Swinton), and in 1707 he became pastor of Ettrick, where he died in 1782. His most esteemed work is entitled *Human Nature in its Fourfold State*, which first appeared in 1720, and has gone through numerous editions. He also wrote a Latin treatise on Hebrew accents, entitled *Tractatus Stigmologicus Hebræo-Biblicus*, &c. A collection of his works was published in 1768, with a memoir written by himself; a more complete collection with memoir appeared in 1852, edited by the Rev. Samuel M'Millan (12 vols.).

BOSWELL, JAMES, author of the immortal biography of Dr. Johnson, was the son of a Scottish judge, Lord Auchinleck (who took this title from the name of his estate), and was born at Edinburgh Oct. 29, 1740. He was educated at Edinburgh, and studied law there and at Glasgow, and early displayed literary tastes. In 1763, when on a visit to London, he was introduced to Johnson, and though this first meeting was not very hopeful for the future, a warm friendship soon sprang up between them. In 1765, in view of becoming a member of the Scottish bar, Boswell went to study law at Utrecht, and before returning he visited Berlin, Switzerland, Paris, Italy, Corsica, &c., and made the acquaintance of Voltaire, Rousseau, and Paoli, who was then at the head of the Corsican party of independence. Returning in 1768 he was admitted an advocate, but the practice of his profession was little to his taste. In 1768 he published a history of Corsica, with a lively account of his own experiences in the island. The same year he again met Johnson in London, and his intercourse with him was kept up by many subsequent visits to the metropolis; while Johnson himself came to Scotland in 1773, when the pair made their famous journey to the Hebrides. This year also Boswell became a member of the famous Literary Club, with various members of which, such as Burke and Reynolds, he was on terms of intimacy. In 1769 he had married, but he continued mainly dependent on his father till the latter's death in 1782, when he succeeded to the estate. In 1784 he met Johnson for the last time at a dinner at Sir Joshua Reynolds's. Two years after (1786) came out his *Journal of a Tour to the Hebrides with Samuel Johnson, LL.D.* (Johnson's own account of the tour had appeared in 1776). Having latterly been admitted to the English bar, he went on circuit and held for a year or two the recordership of Carlisle; and from 1788 onwards he mostly resided in London. In 1791 appeared his *Life of Johnson* (two vols., quarto), a work which he had been long preparing, and which at once gave readers the same delight as it has ever since inspired. A second and enlarged edition came out in 1793 (three vols., 8vo). By this time Boswell's health had greatly suffered from his too convivial habits, and he died in London on 19th May, 1795, having been a widower since 1790. Boswell was a singular compound of sense and folly, of genuine ability and foible bordering on craziness. His good nature was universally admitted; his vanity and want of self-respect and self-control were his most evident faults. His weaknesses were easily seen, but the man who enjoyed the sincere affection of Dr. Johnson and the enduring friendship of Burke and Reynolds had

better stuff in him than appeared to the superficial observer. His *Life of Johnson* is such a masterly performance as only a genius for life-portraiture could have produced. Among editions of the *Life* may be mentioned that of Croker (ten vols.), and those of Rev. A. Napier (Bohn's Standard Library, six vols.), and Dr. Birkbeck Hill (Clarendon Press, six vols.), all containing the *Tour*. See Macaulay's *Essay*, and the much more humane and penetrating *Essay* of Carlyle. Boswell left two sons.—The elder, ALEXANDER, born in 1775, succeeded to the family estate, sat for a year or two in parliament, and was created a baronet in 1821. He wrote several well-known Scottish songs and various other things in verse and prose, and also set up a private press from which issued reprints of rare old works in the Auchinleck library. In 1822 he met his death in a duel with a Mr. Stuart, against whom he had made some severe attacks in a political journal.—JAMES, the second son, born in 1779, died in 1822, was the editor of an improved edition of Malone's *Shakspeare*, generally known as the *Variorum Shakspeare* (21 vols., 1821); he was also the author of a *Memoir* of Mr. Malone.

BOSWORTH, a small town in the county of Leicester, England, about 3 miles from which is Bosworth Field, where was fought, in 1485, the memorable battle between Richard III. and the Earl of Richmond, afterwards Henry VII. This battle, in which Richard lost his life, put a period to the long and bloody Wars of the Roses, between the houses of York and Lancaster. Pop. 1149.

BOTANIC GARDENS, establishments in which plants from all climates, and all parts of the world, are cultivated in the open air, in greenhouses and hothouses, mainly for the study of botany. Theophrastus seems to have instituted the first botanical garden. Attalus, king of Pergamus, and Mithridates of Pontus, established gardens, where they cultivated poisons and antidotes. Pliny mentions a botanical garden which was laid out in Italy by Antonius Castor, son-in-law of King Delotarus. In the middle ages Charlemagne established such gardens near the imperial palaces and castles, specifying even the particular plants which were to be grown. In the beginning of the fourteenth century Matthew Sylvaticus, at Salerno, founded the first *botanic garden*, properly so called. The Republic of Venice soon afterwards, in 1333, instituted a public medical garden, and had the plants painted by Amadei. The paintings are still preserved. After the revival of learning, the first botanical gardens, which contained, however, for the greater part, merely medicinal plants, were laid out in Italy. Duke Alfonso of Este was the founder of an excellent institution of this kind in Ferrara; then followed the gardens in Padua, Pisa, and Pavia. Montpellier in France first imitated this example. The academical garden in Leyden was instituted in 1577; that of Paris in 1633; and about the same time the first botanic gardens in Germany and England were founded. At present the largest and most renowned in Germany are the Royal Prussian, near Berlin; and those of Breslau, Halle, and Leipzig. In Austria the chief is the Imperial at Schönbrunn, in the neighbourhood of Vienna. In Great Britain the Royal Gardens at Kew, which under the superintendence of Sir William and Sir Joseph D. Hooker have been greatly extended and improved, and are now perhaps the finest establishment of the kind in the world; the gardens of the Royal Horticultural Society, London; and those at Edinburgh and Dublin, are the most celebrated scientific institutions of this kind. In France the garden in Paris, called the *Jardin des Plantes* (Garden of Plants), with its museums,

is the principal. It was founded by Louis XIII. in 1636, and is also a zoological garden. In Italy, the garden of the university at Turin is perhaps the best; in Spain, the Royal Garden at Madrid; in Denmark, the garden of the university at Copenhagen. The principal botanical gardens in America are at New York, Philadelphia, and Cambridge. In Asia, the garden of the East India Company at Calcutta is the most important; in Australia those of Melbourne and Sydney.—At present most European universities and many large towns have botanic gardens.

BOTANY (Gr. *botanē*, fodder, herb, plant), or **PHYTOLOGY** (Gr. *phyton*, plant, and *logos*, discourse) is the science which treats of the vegetable kingdom. It thus forms one of the two great divisions of biology, or the science of organization and life, the other being zoology.

Plants may be studied from several different points of view. The consideration of their general form and structure, and the comparison of these in the various groups from the lowest to the highest, constitutes *morphology*. The study of the outer forms is called *external*, that of the inner structure *internal morphology*. *Physiology* treats of their functions and of the life-processes of the plant as a whole. *Systematic botany* considers the arrangement of plants in groups and sub-groups according to the greater or less degree of resemblance and genetic relationship between them. It comprises *taxonomy*, or the principles of classification; *terminology*, dealing with the technical nomenclature for the various parts of plants; and *phytography*, or the proper principles of plant-description. *Geographical botany* tells of their distribution on the earth's surface, and strives to account for the facts observed, while *palæobotany* or *fossil botany* affords an explanation of plant life in the successive geological strata which make up the earth's crust. *Æconomic botany* comprises the study of the products of the vegetable kingdom as regards their use to man. *Vegetable teratology* treats of monstrosities or departures from normal type in the vegetable kingdom, and the *nosology* of plants comprises a systematic account of the diseases, both general and special, to which they are subject. Various other terms, such as *organography*, *organogeny*, &c., are in occasional use as names of portions of botanical science, but most of these are either unnecessary or so variously used as to become misleading. No generally accepted arrangement of the divisions of botany yet exists.

The simplest plants are very minute, and can only be studied by use of the compound microscope. A little rain water which has been standing some time when thus examined is found to contain a number of roundish green objects, each of which is an individual plant, consisting of one cell only, with an external limiting membrane or cell-wall of a substance known as *cellulose*, within which is granular, viscid *protoplasm*. The protoplasm contains special *chloroplasts* to hold the green colouring matter, *chlorophyll*, and also an oval darker body, the *nucleus*. *Protoecoccus* (or *Hæmatococcus*) *pluvialis*, as this little plant is called, though so simple, is yet able, by virtue of the living protoplasm, to take up food from the water around it; to work that food up into more cellulose and protoplasm so as to increase in size; and, finally, to produce new individuals, more *Protoecocci*, by a process of cell-division. If we imagine *Protoecoccus* to elongate considerably and be repeatedly divided across by cell-walls, we get a row or filament of cells, a very common form among the low orders of plants: the masses of green threads seen floating in ditches in the spring and summer consist of such a filamentous plant called *Spirogyra*. Or we may have a single

flat sheet of cells, as in the delicate green sea-weed *Ulva*. Increased complexity of structure is exemplified in many of the ordinary sea-weeds, the stalk and more or less flattened expansions of which are several to many cells thick, the external cell-layers differing somewhat in structure from the internal. But we cannot distinguish in any of these between a stem, leaf, or root, as we can, for instance, in the more highly differentiated fern. Plants in which such a distinction cannot be drawn are called *Thallophytes*, and their whole body a *thallus*. Thallophytes can be divided into two classes: *Alga* and *Fungi*. The former are distinguished by the presence of the green colouring matter chlorophyll, which is of vital importance in the physiology of the plant; sometimes the green colour is obscured by the presence of a brown or red compound, as in the brown and red sea-weeds. The Fungi contain no chlorophyll, and also differ in being composed of numbers of delicate interlacing tubes or *hyphae*, often forming, as in the mushroom, quite large and complicated structures. *Lichens* are an interesting class between *Alga* and *Fungi*, inasmuch as they are built up of an *alga* and a fungus, which live together and are mutually dependent on each other—the *alga* supplying the fungus with organic food and receiving from it dissolved salts and water as well as shelter in the fungus body. The host-plants on which the lichen fungi depend for their existence are very small (one- or few-celled *algæ*), and are completely enclosed within the mycelium of those fungi.

Going a step higher we reach the *Hepaticæ* or *Liverworts*, in which we can trace a transition from the thallus-plants or thallophytes to the stem-plants or cormophytes. Above these are the *Mosses*, where, for the first time, we distinguish a clear differentiation of the part of the plant above ground into a stem and leaves borne upon it. The stem is attached to the soil by delicate colourless hairs—*root-hairs*, but though these perform the office of roots they are quite distinct in origin and structure from the roots of higher plants. The structure of mosses is very simple, and the leaves are usually thin plates of cells. In them we note what is known as an *alternation of generations*. The moss-plant proper is the *gametophyte* or *sexual generation*, and it produces male organs, *antheridia*, and female organs, *archegonia*. By the fertilization of the *oosphere* of the latter by the *antherozoids* of the former a cell is produced capable of germinating into a new plant. This new plant is, however, quite distinct from the moss-plant. It consists of a stalk and *capsule* or case containing *spores*; from the spore develops a mass of entangled thread-like bodies called a *protonema*, from which moss-plants proper will in due course be budded off. It is therefore a *sporophyte* or *asexual generation*. Rising still higher to the fern-like plants, including the Ferns proper, *Equisetums* (Horse-tails), and *Lycopods* (Club-mosses), we notice a great advance in complexity both of external form and internal structure. The leaves are large, often much branched, the stem stout and firm, while instead of the few simple hairs which was all the indication of a root-system to be found in the moss, there are well-developed true roots. Microscopic examination of sections of stem, leaf, or root shows great differences in structure between various groups of cells; there is, in fact, marked *differentiation of tissues*. A tissue is a layer, row, or group of cells which have all undergone a similar development; by *differentiation of tissues* we mean that various layers, rows, or groups have developed in different ways, so that we can make out and mark by distinctive names the elements of which a stem or leaf is built up. The structure of thallophytes and mosses is very simple,

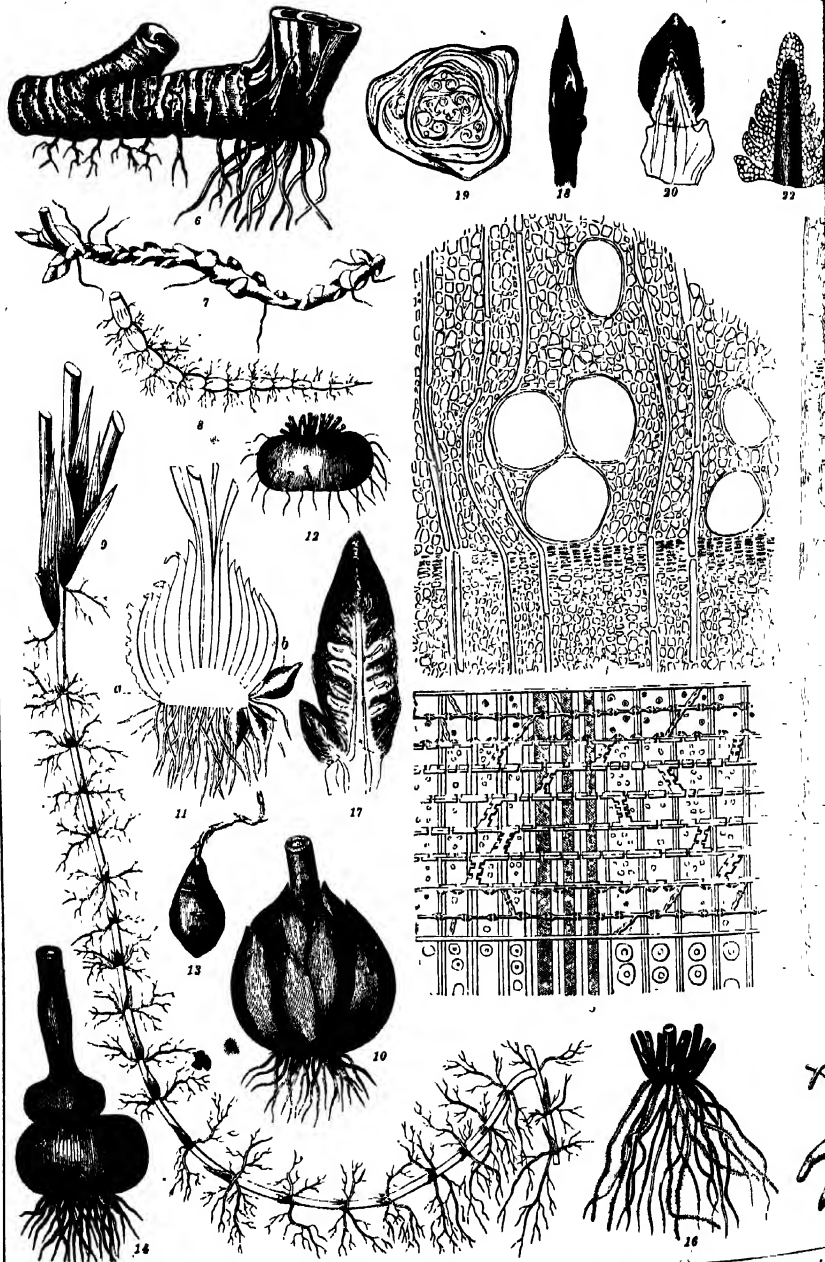


Fig. 1, Cross section of the wood of the Spruce Fir. 2, Do. of the Lärche Tree. 3, Do. of the Ash. 4, Do. of the Aspen.
16, Fibrous Root. 17-36, Figures illustrative of growth and structure of Leaf-buds and

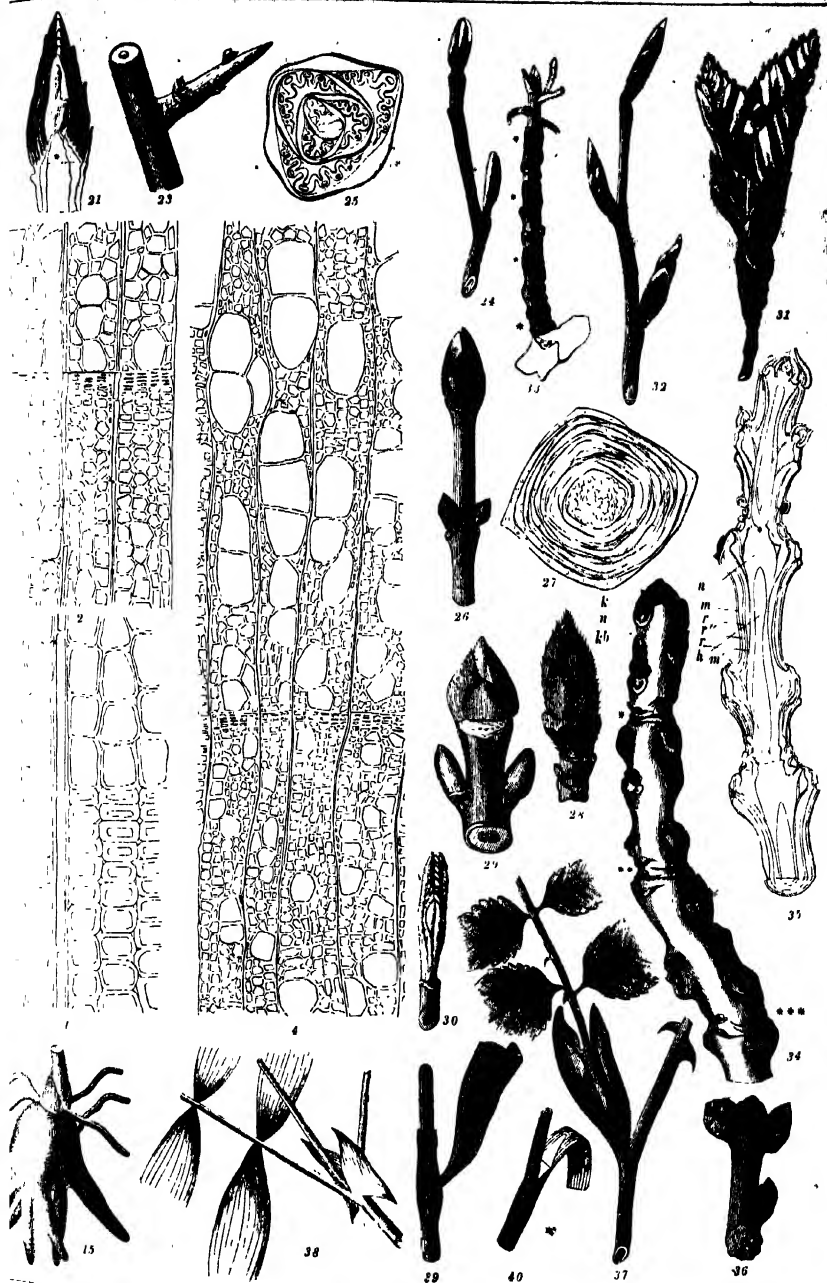


Fig. 1. Longitudinal section of the wood of the Spruce. Figs. 6-9, Rhizomes. 10, 11, Bulbs. 12, 13, Tubers. 14, 15, Corns. 16, 17, 18, Stipules of Leaves. 19, Ochrea. 20, Ligule of Grass. 21, 22, 23, Stems with leaves. 24, Stem with node. 25, Cross-section of stem. 26, Stem with node. 27, Cross-section of stem. 28, Stem with node. 29, Stem with node. 30, Stem with node. 31, Stem with node. 32, Stem with node. 33, Stem with node. 34, Stem with node. 35, Stem with node. 36, Stem with node. 37, Stem with node. 38, Stem with node. 39, Stem with node. 40, Stem with node.

but in the ferns, besides other well-marked tissues, we meet with one of so great importance in the higher plants, and so constantly present, that it is used as a distinctive characteristic of all the plants above the mosses. Ferns and flowering-plants which contain this *vascular tissue* are known as *vascular plants*, in contrast to the thallophytes and mosses, or *cellulose plants*, where it is not found. Microscopical examination of a very thin longitudinal slice of the stem, root, or leaf-stalk of a vascular plant shows bundles of long cells running lengthwise, the walls of which are not uniformly thin, as in the cells making up the groundwork of the portion examined, but are covered with curious markings which are seen to represent local thickenings of the wall, thin places, or *pits*, being left between them. These cells, which are quite empty, are the wood-cells; they are placed end to end, and when, as frequently occurs, the end-walls separating the cavities of two cells become absorbed, a wood vessel is formed. Near the elements of the wood, but differing greatly from them in their delicate, unchanged walls and thick viscid contents, are the *sieve-vessels*, or *sieve-tubes*, so called from the end-to-end communication between two cells being established, not by absorption of the whole wall, but by its perforation at numerous spots forming a sieve arrangement. This combination of wood and bast vessels forms the essential part of what is therefore known as vascular tissue. (See Plate III. of this article.) In the ferns and their allies a well-marked alternation of generations also exists, but with this difference from the mosses, that the plant proper or the prominent generation is the asexual one or the sporophyte. On the back of the frond of a fern there will be seen at the proper season a series of small brown bodies called *sori*. Each sorus contains a number of still smaller *sporangia* or spore-cases, which again inclose the *spores*. From these spores on germination there develops the gametophyte or sexual generation, which in this case is called a *prothallium*. These prothallia are small liverwort-like bodies which produce on the under-surface antheridia and archegonia, by means of which a fern-plant is again produced. In most of the ferns, horse-tails, and club-mosses the spores are all of one kind in each species, and the prothallia are developed entirely outside them; but in the higher vascular cryptogams, including the Marsileaceae, Salviniaceae, Selaginellae, and Isoetes, we find male and female spores produced in each species and a gradually increasing inclosure of the prothallium within the spore. The larger spores, the female or *macrospores*, produce prothallia bearing only archegonia, whilst the small male *microspores* produce prothallia bearing only antheridia.

Phanerogams, or *Flowering-plants*, represent the highest group of plants: *Seed-plants*, or *Spermaphyta*, is a better term, as they differ from those already described in the production of a *seed* in which the embryo is completely inclosed. The much greater variety in form and structure seen in them as compared with the ferns justifies us in regarding them as the highest group in the vegetable kingdom; but botanists are now agreed in considering the old classification of plants into *phanerogamia* and *cryptogamia* as wrong in placing groups of very different rank on the same level. In flowering-plants the process of inclosing the prothallium within the megaspore is carried further, and the prothallia themselves, both male and female, become minute, transformed, and in a sense degenerate. The megaspores are now known as *embryo-sacs* and the *megasporangia* as *ovules*; and in the angiosperms these ovules are themselves inclosed in a chamber called an ovary. The microsporangia are the pollen-sacs, inclosing the

microspores, now called pollen-grains. The sporophylls or leaf-like bodies on which the two kinds of spores were formed take the characteristic forms of *stamens* (the male sporophylls) and *carpels* (the female sporophylls). Moreover, by the confining of the growth of these stamens and carpels to definite parts of definite shoots, by their arrangement in whorls or spirals, and by surrounding them with protective envelopes, the *calyx* and *corolla*, the *flower proper* is produced. Hence the reason of the name *flowering-plants*. They are divided into two classes. (1) Those in which the seed is developed on an open leaf, termed a carpel, and called therefore *Gymnosperms* (Gr. *gymnos*, naked, and *sperma*, seed); and (2) those in which the seed is developed in a closed chamber or ovary, formed by the folding together of one or more carpels, and called accordingly *Angiosperms* (Gr. *angeion*, vessel). To the former belong the *Conifers* (Coniferae)—pines, fir, yew, larch, spruce, cypress, &c.—and the exotic orders of *Yuccals* (Cycadeae) and *Gnetaceae*, to the latter the rest of our trees and the enormous number of field and garden plants which are not ferns or mosses. Angiosperms again are subdivided into *Monocotyledons*, where the embryo or young plant contained in the seed has only one primary leaf or seed-leaf; and *Dicotyledons*, where an opposite pair of such leaves is present. This distinction between 1-cotyledoned and 2-cotyledoned plants is the index to many other important differences of structure, such as the nature and arrangement of the vascular bundles, the veining and shape of the leaves, the number of parts in the flower-whorls, &c. Like the vascular cryptogams, Phanerogams are differentiated into a shoot portion above the ground, consisting of a stem bearing leaves, and a subterranean root-portion. Both stem and root are often copiously branched, so that one individual may cover a large area both above and below ground. Stem, leaves, and roots all show great variety in form and adaptation.

The embryo, or rudimentary plant (see Plate II., figs. 56–61) contained in the seed, consists of a very short axis or stem, bearing one (in Monocotyledons), two (in Dicotyledons), or several (in many Gymnosperms) primary leaves, the *cotyledons*, above which it terminates in a little bud or *plumule*, while below them the axis passes into the primary root or *radicle*. When the seed germinates, the radicle is the first to protrude between the separating seed-coats, and, growing downwards, fixes itself in the soil. Then the plumule grows out, accompanied or not, as the case may be, by the cotyledons, which have hitherto conoealed and protected it, and by rapid growth soon develops into a stem bearing leaves. The stem produces buds and branches, and continues growing throughout the life of the plant; but while in Gymnosperms and Dicotyledons it also continually increases in thickness through its whole length, Monocotyledons are distinguished by the fact that when once the stem has reached a certain thickness its diameter usually remains unchanged. The same rule applies to the branches. The cause of this difference is found in the internal structure. In the Gymnosperm and Dicotyledon (see Plate III.), a transverse section in a very young stage has the following appearance: Starting from the outside we have, (1) a single protective layer of cells with thick external walls, the *epidermis*. (2) Inside this, and forming what is called the *cortex*, are a number of thin-walled cells arranged like bricks in a wall, or touching only at their rounded edges, and leaving intercellular spaces. Such an arrangement, where the cells are not much longer than broad, is called a *parenchyma*. (3) Within the cortex is a ring of vascular bundles, each consisting essentially of a little group

of bast-vessels towards the outside and wood-vessels on the inside, separated by a single layer of cells, the *cambium-layer*. (4) Within the ring of bundles is the *pith*, of parenchyma like the cortex, and united to it by strands of similar parenchymatous cells passing between the bundles and known as *medullary rays*. As the young stem grows, however, the cambium between the bundles starts a development of fresh bast, parenchyma, and wood, so that instead of a number of separate bundles there is a *complete vascular ring*. The cambium-ring remains in active growth throughout the whole life of the plant, and by producing new bast on the outside and wood on the inside causes continual increase in thickness. The epidermis, which would of course soon give way beneath the strain of the growth inside, is replaced as a protective layer by the *bark*, development of which keeps pace with increase in diameter. Now in the young monocotyledonous stem, instead of a few bundles arranged in a ring separating pith from cortex, a great number are scattered through the whole internal parenchymatous tissue, so that we cannot distinguish any pith at all. The bundles, moreover, have no cambium-layer, so that when once formed their development is complete, and there is no increase in thickness. Such bundles are described as *closed*, whilst those of dicotyledonous plants are known as *indefinite* or *open* bundles. Stems, which may be *simple* or *branched*, are either *aerial* or *subterranean*. *Aerial* forms are, (1) *erect*, as the trunks of trees, or the more slender stems of most herbaceous plants, or the hollow *culms* of grasses; (2) *prostrate*, as the creeping runners of the strawberry; (3) *ascending*, when they rise obliquely upwards; (4) *decumbent*, trailing but ascending at apex; (5) *creeping*, prostrate and rooting at intervals; or, (6) *climbing*, in which case they may either twine round a support, like the hop; or hold on by means of *prickles*, like the bramble; or more usually by *tendrils*, as in the vine; or, finally, by *roots* given off from the stem, as in the ivy. Examples of subterranean stems are, (1) the *rhizome* (Plate I, figs. 6-9), a horizontal stem sending forth aerial shoots from its upper and roots from its lower surface, as in the iris, the peppermint, the sand-sedge, &c.; (2) the *tuber* (Plate I, figs. 12-13), a much-swollen fleshy underground branch, like the potato, the eyes of which are buds; (3) the *bulb* (Plate I, figs. 10-11), a very short undeveloped stem with overlapping fleshy leaves, as in the lily and the onion; (4) the *corm* or *solid bulb* (Plate I, figs. 14-15), a sort of bulb in which the main body consists of the thickened axis, the scales being few and small, as in crocus, colchicum, &c.

Branches proceed from buds which are formed in the autumn in the axils of the leaves, that is, at the point where the leaf or leaf-stalk is joined on to the stem; they remain dormant through the winter, and grow out into new shoots in the spring. These buds are simply contracted shoots in which, though the leaves have been produced as usual, the axis, owing to weather conditions, has not elongated; and when in the spring this elongation is resumed the bud takes on the ordinary form of the shoot (Plate I, figs. 17-36). Branching by *dischotomy* or forking, that is, by the division of an apex into two, is common among cryptogams, but in flowering-plants it is almost unknown. Branches usually arise from the sides of the parent shoot, just behind the growing point, or, as it is called, in *acropetal* succession.

The *leaf* is borne on the stem; its tissues, epidermal, cortical, and vascular, are continuous with those of the stem; but it is distinguished by the fact that its growth is limited, and thus it soon reaches the normal size and stops growing. The

places where leaves come off from the stem are called *nodes*. There is great variety both in the position and form of leaves. Their position is said to be *radical* when they are all borne close together at the base of the stem, as in the dandelion; or *cauline*, when they are borne on the upper parts; in the latter case they may have a *whorled* arrangement, where several come off at the same level in a circle round the stem, as in the herb *Paris* and goose-grass; or *opposite*, where two stand on opposite sides at each node, as in the gentians, lilac, &c.; or *alternate*, where only one comes off at the same level. The study of leaf arrangement is known as *phyllotaxis*. A leaf may be *stalked* or *sessile*; if sessile, the blade is joined directly on to the stem. The stalk is known as the *petiole*, the flattened expanded blade as the *lamina*. The leaf may be *simple* (Plate II, figs. 1, 2, 3, 4, &c.) or *compound* (Plate II, figs. 7 and 8). A simple leaf cannot be divided without tearing the lamina; while a compound leaf is made up of independent leaflets, which may all come off from the same point as in the horse-chestnut, which is the *digitate* or *palmate* form (Plate II, fig. 5); or may be arranged along a continuation of the petiole, as in the ash, which is the *pinnate* form of a compound leaf (Plate II, figs. 7-8). The *ternate* leaf may be regarded as an intermediate form; in it there are three leaflets springing from nearly the same point, as in the strawberry. A simple leaf, or a leaflet of a compound leaf, is described in respect of shape, toothing, &c., by various terms. In shape it may be (1) *linear*, as in grasses; (2) *lanolate*, or lance-shaped; (3) *elliptical*; (4) *ovate*, or egg-shaped (Plate II, fig. 2); (5) *orbicular*, or *circular*; (6) *cuneate*, or wedge-shaped; (7) *spatulate*, as in the daisy; (8) *cordate*, or heart-shaped; (9) *reniform*, or kidney-shaped; (10) *sagittate*, or arrow-shaped; (11) *hastate*, or halberd-shaped; &c. As regards its apex, it may be *acute* (Plate II, fig. 2), *obtus* (Plate II, fig. 1), *emarginate* or *notched* (Plate II, fig. 7), &c.; and its edge may be *entire* or *untoothed* (Plate II, fig. 1); *serrate* (Plate II, fig. 2), with small sharp teeth pointing forward; *dentate*, when the teeth point outwards; *crenate*, with rounded teeth; *sinate*, with wavy outline; *incised* or *jagged*, when irregularly toothed; &c. When the incisions of the edge penetrate deeper, the leaf becomes *lobed* (Plate II, fig. 3), and this lobing may be, according to the venation of the leaf, pinnate or palmate. The deeper lobings may be called *pinnatifid*, *pinnatipartite*, or *pinnatisect* (Plate II, figs. 4 and 6). At the foot of the petiole of the leaf in many plants, such as the rose, the pea, and the vetches, two small leaf-like bodies, called *stipules*, are found. Leaves with stipules are described as *stipulate*; others are *acstipulate* (Plate I, figs. 37-40). The tissue of the lamina is traversed by vascular bundles, which are continuous through the petiole with those of the stem. The infinite variety of their ramifications is the cause of the often very characteristic *venation* of the leaves. In dicotyledons the veins and veinlets usually form a sort of net-work, and the leaves are then known as *net-veined* or *reticulated*. In monocotyledons, on the other hand, the main veins usually run in a sort of parallel manner along the length of the leaf, and are connected by cross veinlets forming a kind of lattice-work; these are called *parallel-veined* leaves. *Net-veined* leaves, again, may have the main veins arranged in a palmate manner, when they are called *palmately-veined*, or in a pinnate manner, when they are described as *pinnately-veined*, the main central vein being called the *midrib* of the leaf. Leaves are said to be *deciduous* when they fall annually, as they do in the most common forest-trees; or *persistent*

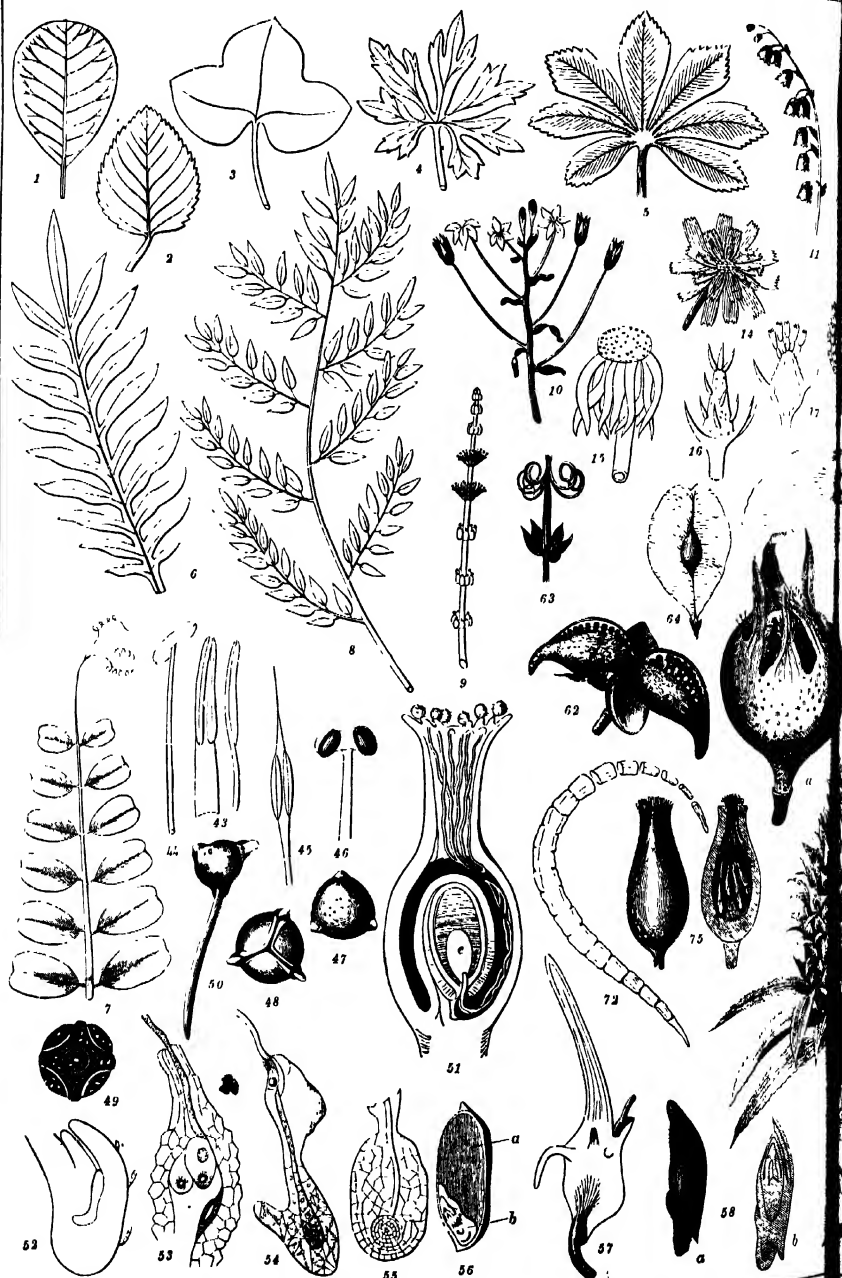


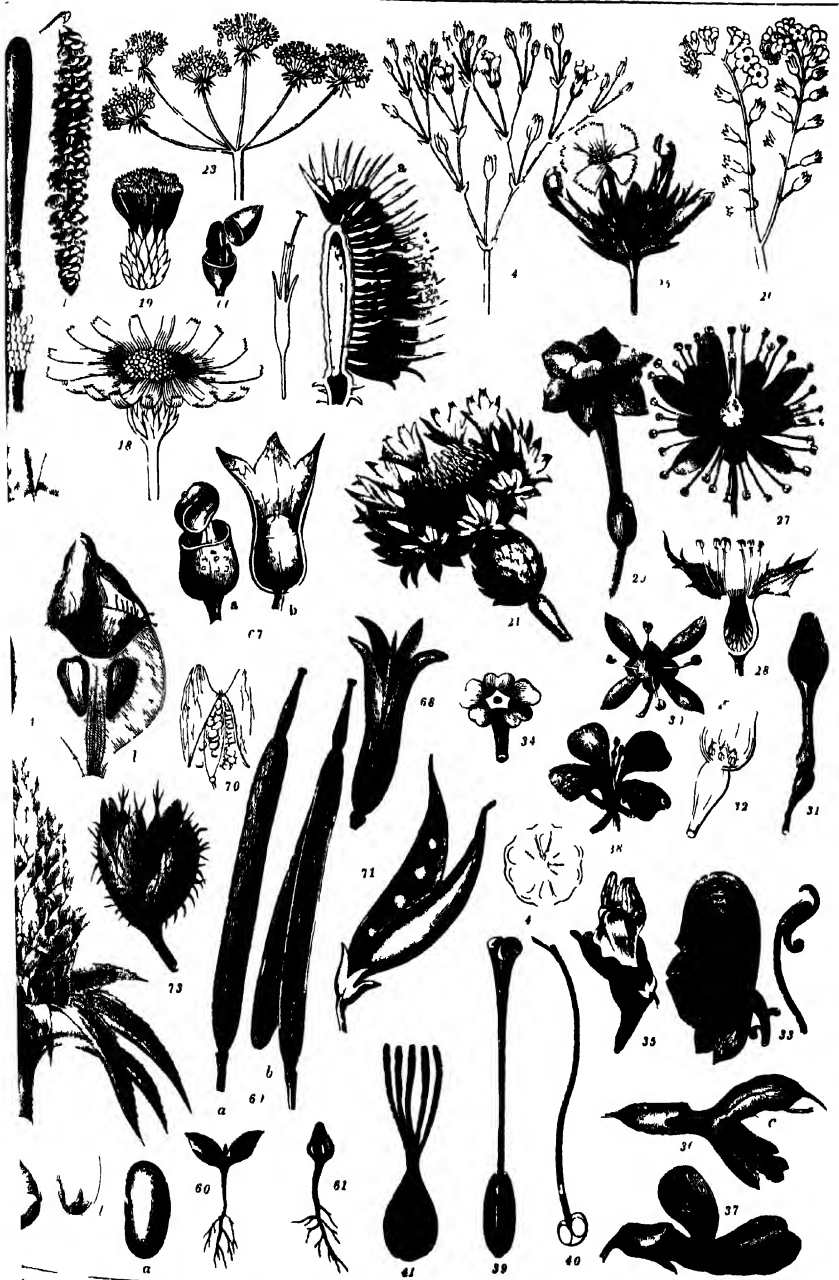
Fig. 1-8, Forms of Leaves.

9-26, Forms of Inflorescence.

27-35, Structure of the Flower and Form.

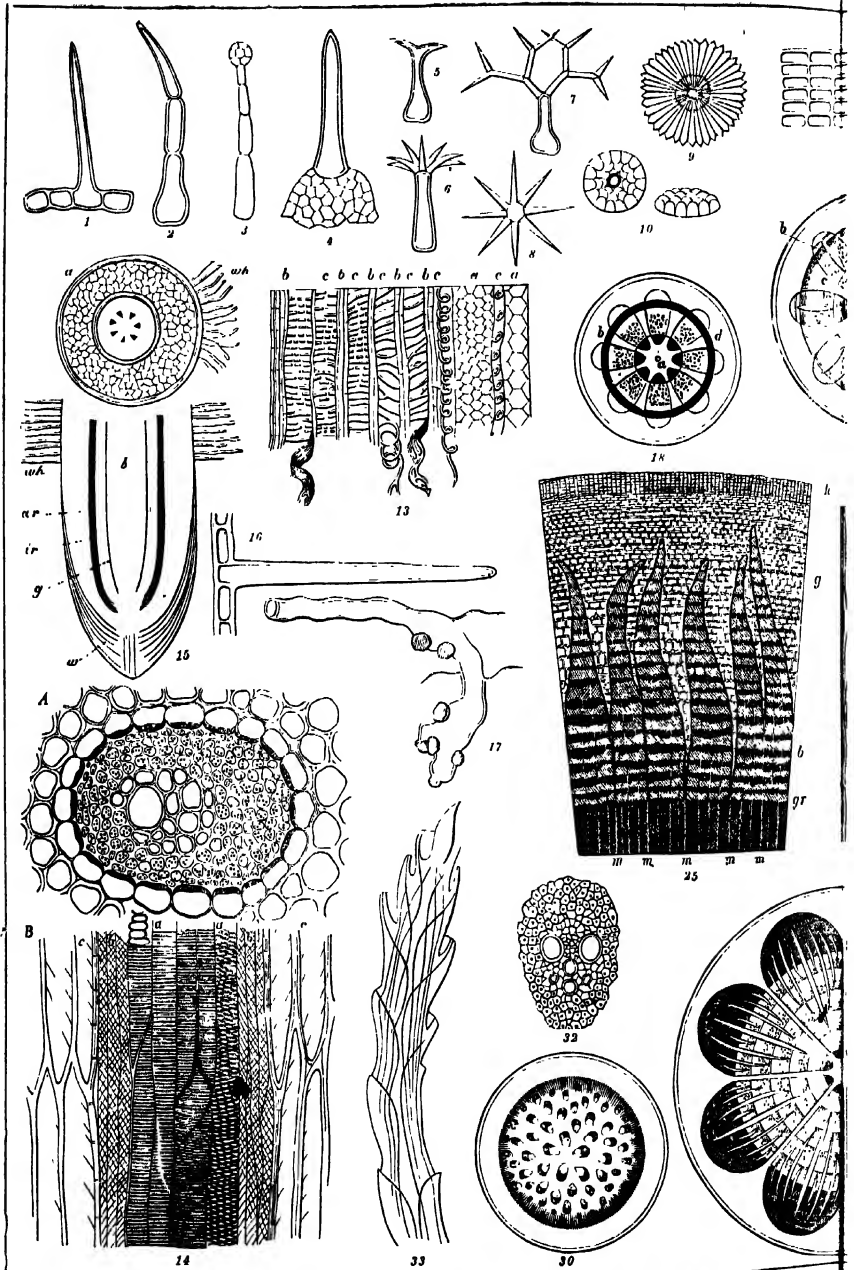
36-55, Process of Fertilization and Embryo Formation.

56-59, Structure of

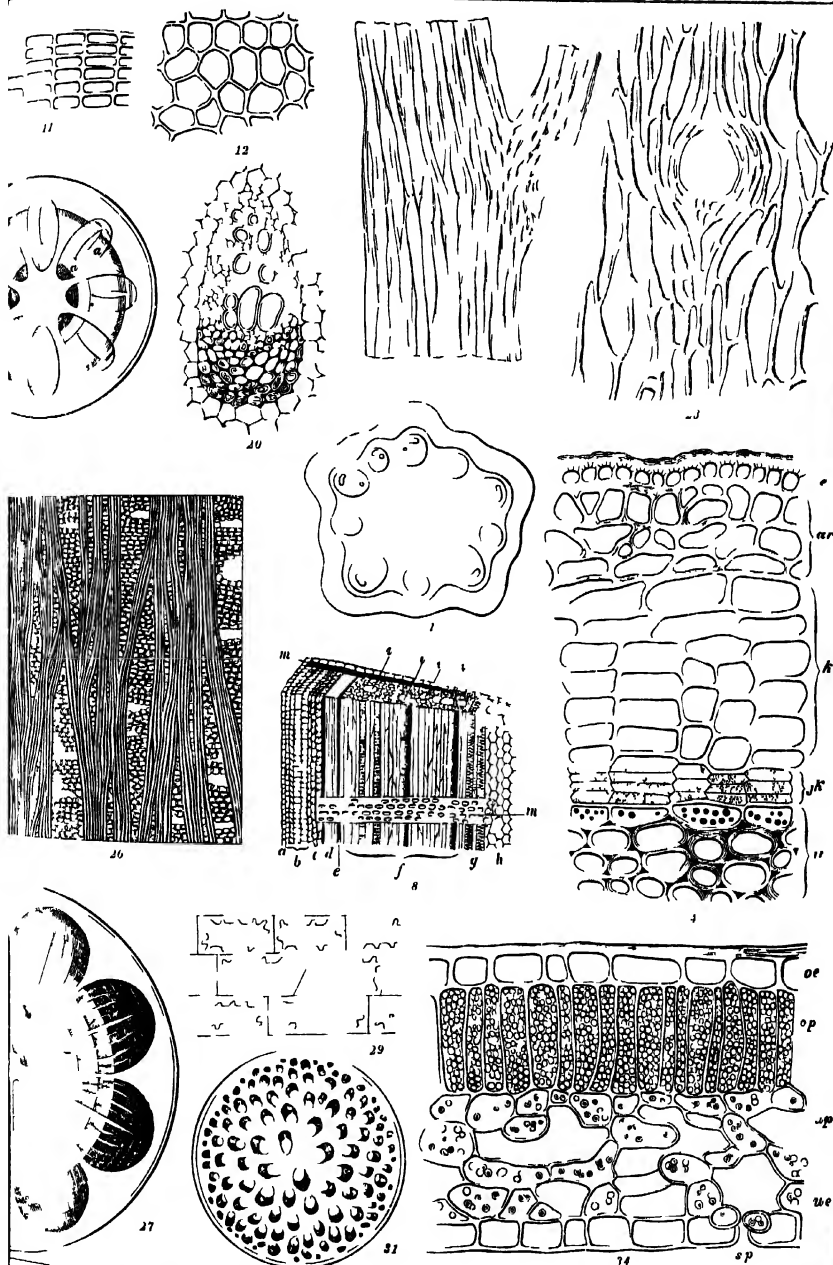


10 1
Seed a 11
cloves
ryo

20-42, Structure of the Pistil. 43-50 Structure of Anthers and Pollen Grains
60 61 Embryo Plants. 62-76, Forms of Fruits.



Figs 1-10 Epidermal Appendages. 11, 12 Outer Bark of Birch 13 Longitudinal section of vascular bundle in the Balsam. 14 Cross and longitudinal section of a vascular bundle in do. 15 Cross section of stem of Clematis. 16, 17 Network of Vessels from stem of Row-thistle. 18 Ideal structure of Exogenous stem. 19 Medullary ray of Oak 20, 21 Ideal cross section of Endogenous stem. 22 Cross section of a stem. 23 Cross section of a stem. 24 Cross section of a stem. 25 Cross section of a stem. 26 Cross section of a stem. 27 Cross section of a stem. 28 Cross section of a stem. 29 Cross section of a stem. 30 Cross section of a stem. 31 Cross section of a stem. 32 Cross section of a stem. 33 Cross section of a stem.



11 Vascular tissue in a Fern 12 Do of young Alder root 13 Root hairs 14 Ideal cross section of a Dicotyledonous stem
 15 Black Currant Bark 16 Cross and longitudinal sections of fiber in Lime tree 17 Ideal section of a Dicotyledonous stem
 18 Vascular bundle 19 Longitudinal section of Birch stock of Iris 20 Vertical section of Beech leaf

when they last longer, as in the fir, laurels, &c. Leaves or leaflets are often very much modified or *metamorphosed*; thus the spines of the cactus are *metamorphosed* or modified leaves; many tendrils, such as those of the pea tribe, are leaflets; the curious pitchers of some plants (see CARNIVOROUS PLANTS) are modified leaf-stalks. When we consider the flower we shall find that its various members are all more or less modified leaves.

In Dicotyledons and Gymnosperms the primary root or radicle after emerging from the seed continues to grow vigorously, often with copious lateral branching, forming an extensive root-system; but in Monocotyledons it soon perishes, and its place is taken by roots developed from the base of the stem; such roots are called *adventitious*, or, more properly in this case, *secondary*. Adventitious roots occur also in Dicotyledons, as in creeping stems like the strawberry, which bears buds at intervals from which new shoots are formed and roots given off. The clinging roots of the ivy are also adventitious. There are many forms of roots: some are large and woody, as those of trees; others fibrous, as in grasses (Plate I, fig. 16); or they may be greatly swollen, forming tap roots, such as the fleshy globose root of the turnip, or the conical one of the carrot. Such fleshy developments are due to the plant storing up a quantity of reserve food-material in the first year on which to draw in the second, when it will want to expend all its energy in flowering and fruiting. The potato, which is a swollen stem, answers the same purpose. The mistletoe and other parasites give off sucker-like roots which penetrate into the tissues of their host.

As to their reproduction, plants may be *asexual*, that is, not requiring the co-operation of two distinct (male and female) elements to produce a new individual; or *sexual*, when two such elements are necessary, and a process of fertilization takes place in which the female cell is impregnated by one or more male cells, and the cell resulting from the fusion of the two gives rise by very extensive growth and division to a new individual; or, as in many cryptogams, they may reproduce their species both asexually and sexually, in more or less regular rotation. In the very lowest plants, like Bacteria, only asexual reproduction is known, but in most Thallophytes both forms occur. In the higher forms of these latter numbers of small cells called *spores* or *conidia* are produced which on germination give rise to a plant similar to that which bore them. In the sexual process the contents of a male organ (usually called an *antheridium*) escape and impregnate the *oosphere*, or female cell contained in the female organ (usually known as an *archegonium*). The fertilized *oosphere* is termed an *oospore*, and by growth and division gives rise to a plant like that on which it was produced. In mosses and fern-like plants both sexual and asexual reproduction occur; but here, as explained above, the life-history of the plant is divided into two stages, one in which it exists as an asexual individual, another in which it is sexual.

What we call a fern is in reality the sporophyte or asexual individual producing spores. The spores when set free germinate on a damp surface and produce not a new fern-plant, but a tiny green heart-shaped cellular expansion, called a *prothallium*, attached to the substratum by delicate root-hairs. Microscopical examination of its under surface reveals the sexual organs (the antheridium) producing motile male cells, which escape, pass into the female organ, and fertilize the *oosphere*, which then becomes the *oospore*. The *oospore* does not produce a new prothallium, but a fern-plant like the one with which we originally started. The cycle is thus complete.

The flower (Plate II., figs. 27-38) of a seed-plant is a shoot modified for purposes of reproduction. A buttercup, for instance, consists of a number of modified leaves borne in several whorls on the somewhat expanded top of the stalk, the *receptacle* or *thalamus*. Dissection of the flower shows (1) An outer whorl of five green or greenish-yellow leaves, very like ordinary foliage leaves; these are the *sepals*, and together make up the calyx. (2) An inner whorl of five yellow leaves, composing the *corolla*, each leaf being a *petal*; this is the most conspicuous part of the flower. (3) More or less protected by the petals are a great number of *stamens*, arranged in circles, each consisting of a slender stalk or *filament* capped by an *anther*, a little case containing the dry powdery *pollen*. The stamens are really much-modified leaves; collectively they form the *androeium*. (4) The rest of the receptacle right up to the apex is also covered by very much modified seed-like leaves, spirally arranged, the *carpels*, forming the *pistil* or *gynaeceum*. Each carpel consists of a basal portion the *ovary*, in which is contained an *ovule*, and of a terminal beak-like portion, the *style*. The androeium and gynaeceum, being the parts directly concerned in reproduction, are distinguished, as the *essential* organs of the flower, from the calyx and corolla, which are only indirectly so concerned, though of great importance in the process. The ovule (Plate II., figs. 43-50) contained in the ovary is equivalent to the spore, or rather spore-case, produced by the fern, but instead of escaping and producing an independent sexual individual it remains in the ovary, where processes go on *within* it corresponding to those resulting in the formation of the free and independent prothallium of the fern, and finally an *oosphere* is produced. Pollen from the stamen of the same or another plant has meanwhile been brought on to the special receptive portion of the style known as the *stigma*, where it protrudes a long tube which reaches right down through the style to the ovule. This tube contains the male nucleus; it comes into close contact with the *oosphere* and fertilizes it. The *oosphere* then becomes an *oospore*, which by growth and division forms the *embryo* or new plant, while still included in the coats of the ovule. The ovule thus becomes the seed, which ultimately leaves the mother plant, bearing with it the embryo.

In the buttercup the members of each whorl of leaves composing the flower spring from the receptacle quite independently of each other, and of those of adjoining whorls. In many flowers, however, *cohesion* takes place between the similar members of a whorl; thus the petals frequently cohere to a greater or less distance from their base, and two great divisions of the Dicotyledons depend on this condition, namely, *Polypetalae*, where the petals are free, as in the buttercup and poppy; and *Gamopetalae*, with more or less coherent petals, as in the harebell and primrose. Likewise the calyx may be, as in the buttercup, *polysepalous* (or *chorsepalous*) or *gamosepalous*; and similarly the gynaeceum, instead of being composed of free carpels as in the buttercup, the *apocarpous* condition, may be formed by the cohesion of several carpels into a one- to several-chambered compound ovary, as in the snap-dragon, when it is said to be *syncarpous*. A gynaeceum of only one carpel must of necessity be apocarpous, but in such a case the term *monocarpellary* is often used to describe it. The stamens of a flower are described as *syngeneis* when, as in the whole order of Compositae, the anthers are united whilst the filaments are distinct. When they are united by their filaments, they are described as *monadelphous*, *diadelphous*, *polyadelphous*, &c., according to the number of groups so formed.

Adhesion also occurs between members of different whorls; thus the stamens are frequently inserted on the base of the petals, so that if we pull off a petal a stamen comes with it; and sometimes, as in orchids, the androecium and gynoecium are adherent, forming a *column* or *gynostemium*. If the other floral whorls are inserted on the receptacle beneath the pistil they are said to be *hypogynous* and the pistil *superior*, as for instance in the poppy; if, on the other hand, as in the fuchsia, they spring from the top of the ovary, they are said to be *epigynous* and the pistil *inferior*. At the base of each petal of the buttercup, on the inner surface, a small nectary will be noticed. It is from these nectaries or honey-glands that bees obtain their honey, and in the process of obtaining it they are dusted by the pollen if the anthers are mature. This pollen they carry in the course of their wanderings to other members of the same species having the pistil ready for fertilization. Plants fertilized thus by the aid of insects, or in a similar way by the wind (as in many of our trees), are said to be *cross-fertilized*, the former being distinguished as *insect-fertilized* or *entomophilous*, and the latter as *wind-fertilized* or *anemophilous*. In the ordinary buttercup very few of the carpels are mature before all the stamens have shed their pollen, and thus, though self-fertilization is possible and does occur, cross-fertilization is much the commoner method; such a plant is described as *protandrous* or *proterandrous*. Similarly, a plant whose stigmas are mature before the anthers is *protogynous*. (See CROSS-FERTILIZATION in SUPP.) The *inflorescence* of a plant is its mode of flower-bearing, but is also often used of the flower-clusters themselves. It is of two general types, *indeterminate* and *determinate*. In the former only the lateral axes or pedicels terminate in flowers, whilst the central axis or rachis does not; in the latter, flowers terminate both the central and lateral axes. In the first the lower or outer flowers are the first to expand, and thus this mode is known as the *ascending* or *centripetal*; the latter being, on the contrary, *descending* or *centrifugal*. The chief special forms of the first type are (1) the *raceme* (Plate II, fig. 11), a simple cluster having the flowers on somewhat equal stalks or pedicels springing from a more or less elongated rachis or main axis; (2) the *corymb* (Plate II, fig. 10), in which the pedicels are of such lengths as to make the cluster flat-topped or nearly so; (3) the *umbel* (Plate II, fig. 23), like the last, but with an extremely short rachis and nearly equal pedicels, which thus appear to come from one point; (4) the *head* (Plate II, fig. 18), a globular group of flowers either sessile or very shortly pedicellate; (5) the *spike* (Plate II, fig. 12), like a head, but with a longer axis. To the determinate type belong (1) the *cyme* (Plate II, fig. 24), a general term for any centripetal inflorescence; (2) the *glomerule* (Plate II, fig. 26), a head formed on the determinate type; (3) *cymose racemes*, *spikes*, &c. Other terms are employed, of which the most important is *panicle*, either restricted to a compound raceme or used of any open, much-branched flower-cluster. In connection with flowers and inflorescences we often find special forms of leaves called *bracts* (Plate II, fig. 10), which are sometimes large and very like ordinary foliage leaves, but are in other cases smaller and membranous, or scaly. A circle of bracts around the base of a head or umbel is known as an *involucre* (Plate II, figs. 18 and 23). A particular form of inflorescence is sometimes persistent throughout an entire order, as the compound umbel in Umbelliferae, and the head in Compositae.

An important characteristic is the *fruit*, which is the result of fertilization on the ovary. While the changes are going on by which the ovule becomes

the seed the ovary also grows, often enormously, and forms the *pericarp*, which surrounds and protects the seed or seeds. The pericarp consists of an outer layer or *epicarp*, a middle layer or *mesocarp*, and an inner or *endocarp*. The outer usually forms the skin of the fruit; the two others may be succulent as in the berry, or the mesocarp only may be succulent and the endocarp hard and stony as in the plum. Besides the embryo the seed contains a store of food-material on which the young plant feeds during the first stages of its growth, and the seed itself is surrounded by a coat called the *testa* derived from the ovule. This consists of albuminous, starchy, or fatty matter. In what are called *albuminous* seeds, as those of palms, the seed is chiefly composed of food-material in which is embedded a small embryo; the edible part of a cocoa-nut is the albuminous reserve-material. In other seeds, like the bean, the fleshy cotyledons have already absorbed this food-material into themselves, and the seedling draws on its own cotyledons for support; these seeds are known as *ex-albuminous*. Many terms are used to describe various forms of fruits; of these the most important are (1) the *legume* (Plate II, fig. 71), a pod which dehisces or opens when ripe by both sutures, as in peas and the whole family of Leguminosae; (2) the *follicle*, a pod dehiscent by one suture only, as in *tearash-marigold*; (3) the *capsule*, a loosely used term, denoting the dehiscent, compound pod; (4) the *siliqua* (Plate II, fig. 70), a sort of narrow two-valved capsule, as in *Lady's-smock* and many other of the Cruciferae; (5) the *siliqua*, a short siliqua, as in *Shepherd's-purse* and other crucifers; (6) the *samara* or *key* (Plate II, figs. 64, 65), an indehiscent, winged, one-seeded fruit, as in elm, birch, maple, &c.; (7) the *achene*, a small, hard, dry, one-seeded, indehiscent fruit, as in the buttercup and other ranunculaceous plants; (8) the *nut*, differing from the last-named in its larger size, and in being compound and many-ovuled in its unfertilized condition, though single-seeded and one-celled when ripe, as in beech, oak, and other trees; (9) the *drupe*, a stone fruit like the cherry or plum; (10) the *berry*, a fruit with a fleshy pericarp, as the grape, gooseberry, &c.; (11) the *strobilus* or *cone*, the characteristic fruit of coniferous trees; (12) the *sorosis* of the mulberry and (13) the *rycenus* of the fig are multiple fruits, or an inflorescence in fruit.

It was stated above that the ovule might be fertilized by pollen from the same flower or from another plant; experiment has shown that the latter produces better results, both as regards quality and quantity of seed, and the vigour of the seedlings. That is, *cross-fertilization* is preferable to *self-fertilization*, and the various, often extremely curious, shapes of a flower and its parts are mainly for the purpose of ensuring the former and preventing the latter.

Many flowers contain both stamens and pistil; these are termed *bisexual* or *hermaphrodite* (♂); while others contain stamens or pistils only, such are said to be *unisexual*. When both male (♂) and female (♀) flowers occur on the same plant the species is *monocious*, like the hazel; while it is *diocious* if the separate sexes are borne on different individuals, as is the case in the hop.

Plants which, like the sunflower, pass through all the stages from germination to production of fruit and seed in one season, and then perish, are called *annuals*; if two years are required, as with the turnip and onion, they are called *biennials*; while *perennials* last several to many years, during which they may flower and seed many times. In some plants only the rootstock is perennial, the parts of the plant above ground dying away each year.

Physiology.—A plant is built up chiefly of four elements: carbon, hydrogen, oxygen, and nitrogen, with small quantities of sulphur and phosphorus and some mineral matter. Substances containing these must therefore form the food. A green plant can take up its carbonaceous food in a very simple form by means of the green *chlorophyll* contained especially in its leaves. This absorbs some of the sun's rays, and by virtue of the energy represented by the light so absorbed the protoplasm can obtain the carbon from the carbonic acid gas present in the atmosphere, and work it up into the organic substances which constitute the plant substance. This process of transformation of inorganic matter into organized material, or of organized into more highly organized materials, is known as *assimilation* or *anabolism*; and the opposite process, which also goes on in living organisms, is called *catabolism*. The two together, regarded as phases of one continuous process, are known as *metabolism*. An animal, having no chlorophyll, has to use more complex carbon-containing compounds, in fact those which have already been worked up in the vegetable kingdom. The other items of the food are obtained from the water and mineral salts in the soil, the salts being brought into solution and absorbed with large quantities of water by the roots. The leaves are the laboratory where the food is worked up into the complex compounds which form the plant substance, and to raise the crude material from the absorbing roots to the leaves there is an upward current of liquid through the stem. This is known as the *transpiration current*; it travels in the wood-cells and vessels. A much larger quantity of water is absorbed than is required as food; this is got rid of by *transpiration*, that is, by the giving off of water-vapour through the stomata of the leaves. This is evident if a plant be placed under a glass shade in the sunlight, the vapour given off becoming condensed on the glass. The complex compounds elaborated in the leaves are returned to all parts of the plant, especially where growth, or storage of reserve-material, is taking place, by means of the other constituent of the vascular bundle, the bast tissue.

Fungi and a few seed-plants contain no chlorophyll and cannot therefore get their carbonaceous food from the carbonic acid gas of the atmosphere, but have to live on decaying vegetable or animal matter, when they are termed *saprophytes* (Greek *sapros*, rotten), like mushrooms, or on living plants or animals, when they are called *parasites*; such are for example the rust of corn, potato disease, and all those bacteria which produce infectious disease. Plants, like animals, breathe; respiration goes on both day and night, and is represented by the absorption of oxygen from, and the return of carbonic acid gas to the atmosphere. If we prevent a plant from breathing, that is, keep it in an atmosphere containing no free oxygen, it will sooner or later die.

Systematic Botany.—In botany, as in zoology, individuals which closely resemble each other form collectively a *species*. Where existing differences are considered too minute to constitute differences of species the set of individuals in which they occur ranks as a *variety* of the species. Species which, though having each some distinctive peculiarity, yet on the whole resemble each other, constitute a *genus*. Assemblages of genera agreeing in certain marked characters form *families* or *natural orders*. The names of the orders are generally formed on the type of *Rosaceae*, the rose order, *Ulmaceae*, the elm order, &c. *Classes*, such as *Monocotyledons* and *Dicotyledons*, contain a large number of natural orders. The older systems of classification were based largely on the uses of plants, for they were studied simply from a medicinal or generally economic point of view. In 1682, however, John Ray discovered the difference between *Monocotyledons* and *Dicotyledons*, and published an arrangement of plants founded on their structural forms, especially on the characters afforded by the seed; this formed the basis of the *natural* system of classification, one, that is, which brings together those genera and families which a careful comparative study of the whole structure and development shows to be most nearly related. Linnaeus did not recognize Ray's great primary divisions, and his system (1735) is a purely *artificial* one, since it only takes account of a few marked characters afforded by one or two sets of organs, and does not propose to unite plants by their natural affinities. He divides *Phanerogams* into twenty-three classes, chiefly according to the number and character of the stamens; each class is subdivided into orders based on the number and character of the styles. To the twenty-three classes of *Phanerogams* he added a twenty-fourth class by the title of *Cryptogamia*. Owing to the exclusive part played by the sexual organs this arrangement is known as the *sexual system*. The great value of Linnaeus's work was his careful scientific revision and adjustment of all the known genera, and his introduction of the binomial system of nomenclature, in which every species has a double name, that of the genus to which it belongs coming first, then that of the species; thus *Bellis perennis* L. is the daisy, and the name shows that the species *perennis* of the genus *Bellis* is the plant in question. The L. which follows indicates that we mean the plant so named by *Linnaeus*. The sexual system is now only of historic interest. By the sagacity of the Jussieus the genera of Linnaeus were more or less naturally grouped under Ray's primary divisions; and by the subsequent labours of De Candolle, Robert Brown, Lindley, and many others we have attained to a fairly natural system, according to the latest edition of which, the *Genera Plantarum* of Benth and Hooker, all our great collections are arranged.

The Angiosperms are subdivided as follows:—

- | | |
|--|--|
| Class I. MONOCOTYLEDONS.—Contains thirty-four natural orders arranged in seven series. | |
| Class II. DICOTYLEDONS. | |
| Sub-class 1.—Polypetalæ (petals free) | Series 1. Thalamifloræ.—Stamens inserted on the thalamus. Contains thirty-three natural orders.
2. Discifloræ.—Thalamus expanded within the calyx into a cup-like disc from which the stamens spring. Contains twenty-two natural orders.
3. Calycifloræ.—Stamens epigynous, or inserted on the edge of the cup-like receptacle. Contains twenty-seven natural orders. |
| 2.—Gamopetalæ (petals united). | Contains forty-five natural orders |
| 3.—Apetalæ (petals absent). | Contains thirty-six natural orders. |

In the most recent classification (that of Engler, *Die Natürlichen Pflanzenfamilien*) this has been greatly altered, and the Apetalæ no longer form a single group.

Distribution of Plants.—The subject of the distribution of organic beings on the surface of the earth has acquired a vastly-increased interest and been treated from an entirely new point of view

since the general acceptance of the theory of development. Previously many of the most curious and striking facts in the distribution of animals and plants were generally regarded simply as isolated phenomena, calling for no really scientific explanation. At the present day existing animals and plants are looked upon as the descendants of a comparatively small number of ancestral types, and questions of distribution are discussed with reference to ancestry, descent, and genetic relationship. It is also recognized that the distribution of plant and animal life is derived from that of earlier geological epochs, and can only be accounted for by taking into consideration the great geographical and climatic changes that have taken place in past ages. Many tracts of land which are now separated by water we know to have been united in earlier times, and thus the possession by them of identical or similar floras and faunas need excite no surprise. But many of our existing plants possess greater facilities for dispersal than might readily be believed. Seeds, for instance, may be transported to considerable distances by water, in the stomachs of birds, and in various other ways; others have appendages provided with hooks, by means of which they can adhere to the bodies of animals, or with wings, parachute-like structures, &c., which enable them to move through the air to some distance from the plant which produced them. Each species has usually a more or less determinate area to which it is confined, but in many cases this area is broken up into discontinuous patches; and for each kind of plant we may assign an approximate centre of distribution. The extent of the range from this centre is determined by such conditions as temperature, moisture, geographical features, the presence of other plants, &c. One of the most important of these conditions is the altitude above the sea-level; mountains have special floras, and many of these alpine also occur in the Arctic circle. The special mode in which a species is distributed throughout its area is determined by various physical and chemical circumstances, such as the nature of the soil, exposure, &c. Some plants grow equally well in any kind of soil, others grow in all soils but prefer one special kind, whilst still others cannot grow except on a particular variety of soil. The first of these kinds is most adapted for wide distribution, whilst the last includes species of limited range. Another important factor in the distribution of vegetable life is the influence of man. Man has considerably extended the range of several species of plants, sometimes consciously by cultivation, at other times unintentionally. On the other hand he has made many species either quite or almost extinct, particularly those hurtful to cultivated food plants. Not a few cultivated exotics have now firmly established themselves in a wild state in various parts of Britain, and several indigenous species are dying out owing to indiscriminate collecting, drainage operations, &c. Bentham gave a classical explanation of the subject of plant distribution in accordance with the more modern views. In his presidential address of 1869 to the Linnean Society he distinguished three chief regions of vegetation, and divided them into several sub-regions. The first of these, the Northern, includes Europe, North Central Asia, and part of North America, and is characterized by such plants as the needle-leaved Conifers, catkin-bearing or amentaceous trees (willow, hazel, birch, oak, &c.), the Ranunculaceae or Crowfoot tribe, the Cruciferae (including turnip, stock, mustard, wallflower, &c.), the clovers and their allies, and other herbs. It includes three types, namely, the Cold or Alpine-Arctic, the Intermediate or Temperate, and the Hot

or Mediterranean-Caucasian. The second or Tropical region includes Africa, large part of America, part of Asia (India, China, Malaysia), and part of Polynesia, and is distinguished by many arborescent species of polypetalous dicotyledons and by large monocotyledonous forms. The Southern or Austral type comprises, according to Bentham, four types, all characterized by Restiaceae, Ericaceae, Proteaceae, single-leaved Papilionaceae, &c. These are (1) the Andine or Antarctic-Alpine type, including the genera *Fuchsia*, *Gaultheria*, *Calceolaria*, &c., and extending throughout the andine region of South America, part of the west of North America and of Eastern Asia, and portions of Australasia; (2) the Australian type, distinguished chiefly by the gum-trees (*Eucalyptus*), the grass-tree (*Xanthorrhoea*), *Banksia*, *Ilakia*, *Dryandra*, Acacias, Epacridae, &c.; (3) the South African type, a rich flora in proportion to the area over which it extends; and (4) a type represented in California, Mexico, the Argentine Republic, parts of South Africa and New Zealand, &c. Of subsequent attempts to divide the surface of the earth into botanical regions the most notable are those of Engler and Pruefer, who have elaborated Bentham's system. Careful observation has shown that no species of flowering plant grows in all parts of the world, that only about eighteen have a range of about equal to half the surface of the earth, that only about 120 have a range equal to one-third of the surface, that among the 135 with largest area none are woody, and the great majority belong to the temperate and cold parts of the northern hemisphere, and that in proportion to the number of existing species there are more monocotyledons with an extensive area than dicotyledons. The flora of any part of the world depends very largely on its height above sea-level, and in ascending mountains, particularly in tropical countries, we pass through more or less clearly-defined vertical zones of vegetation. The following belts are usually found in the tropics: (1) The evergreen forest with palms, creepers, and many climbing plants; (2) a region in which the trees lose their leaves in the dry season or may be almost entirely absent; (3) the mountain forest, chiefly of dicotyledons; (4) the coniferous forest of pines, deodars or cedars; (5) the zone of the deciduous or other shrubs; (6) the region of small woody Alpine perennials; (7) the zone of lichens. These vertical zones also correspond very closely to horizontal belts extending from the equator to the poles. The following may be given as a bathymetrical distribution of Algae on the sea-coasts of Europe: (1) A green sea-weed region above or about high-water mark; (2) a brown sea-weed zone, between high- and low-water mark, characterized chiefly by species of *Fucus*; (3) a zone of red sea-weeds or Floridaceae below low-water mark; (4) Plankton or floating, free-swimming algae such as Diatoms and Peridinae.

History.—The science of botany is of comparatively recent growth. Before the time of Linnaeus very little botanical work of a really scientific character had been accomplished, but since his time the progress has been continuous and rapid, especially during the last half-century. The first writer on plants of whom we know anything was Aristotle, and several of his disciples carried his researches further. Of these the chief was Theophrastus, from whom we have two works, *Peri Phyton Historias* (Researches on Plants) and another, in which he describes about 500 species. Four centuries later, in the early years of our era, Dioscorides described rather more species, and made a rude attempt at classification based on the uses of the plants enumerated. The only other ancient writer of note on botany was the elder Pliny, who, like his predecessor

sors, confined his attention to plants useful, or supposed to be useful, in medicine. For many centuries nothing more was done, but at length in the sixteenth century, owing to various causes, several investigators did valuable work. Among these are Brunfels (1470-1534), Tragus or Jerome Bock (1498-1554), Fuchs (1501-1566), Aretius (1505-1578), Valerius Cordus (1515-1544), Conrad Gesner (1516-1565), Lobelius (1538-1616), de l'Ecluse or Clusius (1525-1609), Dodoens or Dodonæus (1518-1586), and Andreas Cesalpinius (1519-1603). The last-named, in a work entitled *De Plantis Libri XVI.* (1583), enumerated 840 species, and classified them according to the characters of the fruit and seed, thus marking a great advance towards more modern arrangements. The greatly developed maritime activity of the sixteenth century contributed greatly to the extension of the knowledge of plant life by introducing to Europeans many of the plants of foreign countries, and it was during this period that botanic gardens began to be formed. Jean Bauhin (1541-1616) and his brother Gaspard (1560-1624) published valuable works on plants; and among other notable botanists of the seventeenth century are John Parkinson (1567-1645); Robert Morison (1620-1683), who developed Cesalpinius's system; John Ray (1628-1704), author of the very important *Methodus Plantarum* (1682) and *Historia Plantarum Generalis* (1686-88), in which he first made the division into Monocotyledons and Dicotyledons, and advanced in several other ways towards the system now adopted; Joachim Jung (1687-1657); Ravinus (1652-1723), who used the binomial nomenclature; Pierre Magnol (1638-1715); and Joseph Pitton de Tournefort (1656-1708), who founded a botanical classification which obtained a wide acceptance for a considerable period, though its primary division was into trees and herbs. In the seventeenth and eighteenth centuries several botanists added considerably to our knowledge of plants by studying their minute structure and physiology with the aid of the microscope. Among these were Nehemiah Grew (1628-1711), Malpighi (1628-1694), Camerarius, Leeuwenhoek (1632-1723), Perrault (1613-1688), Denis Dodart (1634-1707), Stephen Hales (1677-1771), Charles Bonnet (1720-1793), Duhamel de Monceau, Senebier (1742-1809), Kolreuter, and Sprengel. Various attempts to found better systems of classification were made by Burkhart (1676-1738), Boerhaave (1688-1738), and others, but none succeeded in securing general approval till the appearance of the famous sexual system of Karl Linné or Linnæus (1707-1778). His system is explained in his *Systema Naturæ* (1735), and his *Fundamenta Botanica* (1736); and in his *Flora Lapponica* (1737) he was the first compiler of a regular flora. His classification of the vegetable kingdom, though purely artificial in its character, was so convenient that it soon became generally adopted; and it was not until the natural system now in use had reached some degree of completeness that it was abandoned. Of this natural system the founder may be said to be Bernard de Jussieu (1697-1777), who arranged the plants in the royal gardens of France according to such a plan; and since his time it has been modified and developed by his nephew, Antoine-Laurent de Jussieu (1748-1836), Augustin Pyrame de Candolle (1778-1841), Robert Brown (1773-1858), John Lindley (1799-1865), Endlicher (1804-1849), Adolphe Brongniart, and others, and is now practically fixed for a long time to come by Bentham and Hooker in their great work, *Genera Plantarum* (1862-1883). During the nineteenth century, and especially in the latter half of it, enormous progress has been made in the study of vegetable anatomy, his-

tology, and physiology, and cryptogamic botany has been carried to great perfection. This is mainly due to the great improvement of the microscope, but much of the work done has been inspired by the wider conceptions introduced into the science by the work of Darwin, Wallace, and other scientific evolutionists. Among the many notable names belonging to the most recent period are those attached to the following works: Pritzels's *Thesaurus Litteraturæ Botanicae* (2nd ed. 1872); Sachs' *History of Botany* (1875, translated 1890); Leunis' *Synopsis of Botany* (3rd ed. revised by Frank, 1883-86); Prantl's *Text-book of Botany* (translated by Dr. Vines); Wiesner's *Elements of Scientific Botany* (1881-89); Frank's *Text book of Botany* (1892-93); De Bary's *Comparative Anatomy of the Vegetative Organs of Phanerogams and Ferns* (1877, translated 1884); De Bary's *Morphology and Biology of the Fungi, Mycetozoa, &c.*; Sachs' *Lectures on the Physiology of Plants* (2nd ed. 1887, translated 1887); Masters' *Vegetable Teratology* (1869); Lailon's *Histoire des Plantes*, and *Dictionnaire de Botanique*; Engler and Prantl's *Die Natürlichen Pflanzenfamilien* (The Natural Families of Plants), Bentham and Hooker's *Genera Plantarum*; Hooker's *Student's Flora of the British Islands*; Sowerby's *English Botany*; Kerner's *Natural History of Plants* (translated into English and edited by Prof. Oliver, 1895); Bentham's *Handbook and Illustrations to the British Flora*; Straßburger's *Text-book of Botany*; Murray's *Introduction to British Sea-weeds*; Dixon's *Handbook of Mosses*; Cooke's *British Fungi*, &c.

BOTANY BAY, a bay in New South Wales, so called by Captain Cook on account of the many strange plants found growing here. Cook landed in Botany Bay on his first voyage in 1770, and took possession of the country in the name of his sovereign. The penal settlement, founded in 1788, and popularly known by the name of Botany Bay, was established on Port Jackson, some miles to the northward, where the town of Sydney now stands.

BOTH, JOHN AND ANDREW, two Flemish painters, were born at Utrecht about the year 1610, Andrew being the younger. They were the sons of a glass painter, who instructed them in the rudiments of drawing. They afterwards made further progress in the school of Abraham Bloemaert, and went at an early age together to France and Italy. John, attracted by the works of Claude Lorraine, chose him for his model; Andrew preferred the painting of the human figure, and imitated the style of Bamboccio. But although their inclinations led them in different directions, their fraternal affection often united their talents in the same works. Thus Andrew painted the figures in the landscapes of his brother; and their labours harmonized so well, that their pictures could not be suspected of coming from different hands. The ease and fine colouring in the beautiful figures of John cannot be overlooked in spite of the excess of yellow sometimes found in them. Andrew was drowned at Venice in 1650. John, inconsolable for his loss, abandoned Italy, and returned to Utrecht, where he died shortly after.

BOTHNIA, GULF OF, the northern part of the Baltic Sea, which separates Sweden from Finland. It commences at the island of Åland, 60° N. lat., and extends to 66°; its length is about 450 miles, its breadth from 90 to 130, and its depth usually from 20 to 50 fathoms. As its water contains little salt, it freezes over in the winter, so as to be passed by sledges and carriages. It abounds in salmon and other fish, and also in seals.

BOTHRIOCEPHALUS, a genus of cestoid worms which is found very abundantly in the intestines of

predaceous fishes, and one species of which is sometimes found in the intestinal canal of man. It belongs to the same family as the tape-worm (*Tænia solium*), but it is distinguished from it by having its segments broader than they are long; by wanting the four disks which surround the head of the tape-worm, and having in their place two lateral longitudinal openings; and thirdly, by having the sexual organs on one of the flat surfaces of each segment instead of at the edges of the segments. The two longitudinal openings (whence the worm receives its name, from *bothrion*, a little pit, and *kephalè*, the head) do not seem to be organs of nutrition, but merely a kind of suckers by which the worm is enabled to attach itself to the intestines of the animal which it infests, while it is nourished by absorption throughout its whole length. Although, as already stated, this worm generally infests the bodies of predaceous fishes, it is capable of being transmitted to all vertebrate animals, and especially it is found in those birds which live upon fish. The only species which is found in the intestines of man is the *Bothriocephalus latus*, and it is rare to find even this species except among the inhabitants of two distinct parts of Europe, the N. and the centre. It is found, on the one hand, in Russia, in Norway, and in Sweden, and on the other hand, in Switzerland, the N. of Italy, some provinces of Germany, and some departments of France, but rarely elsewhere. It has been remarked that this worm is common where the *Tænia* or true tape-worm is rare, and *vice versa*.

BOTHWELL, a village of Lanarkshire, Scotland, on the N. bank of the Clyde. It is situated 8 miles N. of Glasgow, and about 1 mile beyond it stands Bothwell bridge, where a decisive battle was fought in 1679 between the Scottish Covenanters, commanded principally by their clergy, and the royal forces, commanded by the Duke of Monmouth, in which the former were totally routed. Near the village are the fine ruins of Bothwell Castle, once a stronghold of the Douglasses. The population of the village in 1881 was 1520; in 1891, 2400.

BOTHWELL, JAMES HEPBURN, EARL OF, is known in Scottish history by his marriage to Queen Mary. He was the only son of the third earl, and was born about 1536. He succeeded his father in 1556, thus obtaining important offices and estates, and by 1566 he had attained to high favour with the queen. The plot by which Darnley lost his life in 1567 was of his contrivance, and the queen was suspected of conniving at it. Bothwell was charged with the crime and underwent a mock trial, being of course acquitted. After the death of Darnley he seized the queen near Edinburgh, and carrying her a prisoner to Dunbar Castle, prevailed upon her to marry him. Before this he had divorced his own wife Jean Gordon, sister of the Earl of Huntly. Though seemingly secure in the possession of power, and though created Duke of Orkney by the unfortunate queen, he soon found that his conduct had roused the indignation of the kingdom. A confederacy was formed against him by the barons, the queen was liberated from his power, and he escaped to the Orkneys, and afterwards to Norway. The Danish authorities kept him imprisoned for some time at Malmö, latterly at Drangholm in Zealand, where he died insane in 1578. See the various histories of Scotland, and the Life of Bothwell by Professor Schiørn (English translation, 1880).

BOTOCUDOS, or **AYMORES**, the name of a Brazilian race of Indians. They live 70–80 miles from the Atlantic, in the virgin forests of the coast range (Serra do Mar or Serra dos Aymores), on the borders of the forests of Minas-Geraes and Espírito-Santo, especially on the Rio Doce. They

receive their name from the custom which they have of cutting a slit in their under lip and in the lobes of their ears, and inserting in these, by way of ornament, pieces of wood shaped like the bung of a barrel (Portug. *botoque*). They have oblique eyes and projecting cheek-bones. Their colour is a dirty brown. They go quite naked, and paint their bodies, and a Botocudo warrior with his lip and ear-plugs, his body painted black and red, and his face bright red, strongly reminds one of a denizen of the infernal regions. They are very skilful with the bow and arrow, and live chiefly by hunting. They now number only a few thousands, and are decreasing. They formerly gave considerable trouble at times to the Brazilian government.

BOTOSHANI, a town of Roumania, in Moldavia, on the river Schiaka. The town proper is a badly built place, but the suburbs are more attractive. Pop. (1891), 31,024; (1899), 32,193.

BOTRYCHIUM, a genus of ferns of the sub-order Osmundæ and tribe Ophioglossæ, characterized by its distinct *thece* in a compound spike attached to a pinnate or bipinnate frond. The only native of Great Britain is *B. lunaria*, common moonwort, which grows on elevated heaths and pastures where other ferns are seldom found. It was once supposed to possess great virtues, both magical and medicinal, and was carefully gathered by the light of the moon. *B. virginicum*, the largest of the species, is a native of North America, and is known by the name of rattle snake fern, from growing in places frequented by that dangerous reptile.

BOTRYTIS, a genus of fungi belonging to the section Hypomyces, and familiar by name to cultivators from its connection with the potato disease. The genus contains a number of those minute plants known as moulds and mildews, and of these some have the peculiar habit of growing in the tissues of living vegetables. The threads of which their growth consists creep amongst the loose cells of the under side of leaves, and send up their fertile shoots through the stomata. Many kinds of Botrytis are extremely destructive to various plants. Whole crops of onions are soon destroyed by one species; tares and pease suffer from another, but in a less degree; and a third species is sometimes injurious to turnips. The decay of the leaves and stem in the potato disease is certainly due to *B. infestans*; and its appearance in the diseased tissues of the tuber when exposed to the air makes it at least probable that it is the real source of that destructive murrain. (See POTATO.) Though extremely injurious to the cultivator, these moulds are sometimes very serviceable by destroying weeds. Poppies and other agricultural pests may often be seen looking yellow and unhealthy, when an examination of the under side of the leaves will show that this is owing to the ravages of these minute parasites.

BOTTA, CARLO GIUSEPPE (GUGLIELMO), an Italian statesman, historian, and poet, born at San Giorgio del Canavese in Piedmont, Nov. 6, 1766; died at Paris Aug. 10, 1837. During the time of the French revolution he was a student of medicine at Turin, and adopting revolutionary opinions with enthusiasm, he suffered for his zeal by two years' imprisonment (1792–94). After passing as a physician he entered the French service, and accompanied the expedition which Napoleon sent to Corfu, and he was soon after elected as a member of the provisional government of Piedmont. When this territory was in 1803 annexed to the French Empire, Botta was elected a member of the Corps Législatif, where his behaviour was characterized by a bold opposition to the emperor. During the 'Hundred Days' he was rector of the academy at Nancy, and after the second return of the Bourbons

he went in a like capacity to Rome. The greater part of the remainder of his life was passed by him as a private gentleman at Paris. His chief works belong to the department of history. Among these are: *Storia della Guerra dell'Indipendenza degli Stati Uniti d'America* (Paris, 1809); *Storia d'Italia dal 1789 al 1814* (ten vols., Paris, 1824). He also furnished a continuation to Guicciardini's *Italian History* from 1490–1584, bringing it down to 1789.

BOTTA, PAUL EMILE, son of the preceding, a distinguished French traveller and archaeologist, born about the beginning of the nineteenth century; died at Poissy in April, 1870. While still very young he made a voyage round the world, traversed the western portion of America, and took part as physician to Mehemed Ali in an expedition which set out from Egypt to Sennaar, of which he took advantage to make a considerable zoological collection. At a later period he was appointed French consul at Alexandria, and from this place he undertook a journey to Arabia in 1837, the scientific results of which he communicated to the world in his *Relation d'un Voyage dans l'Yémen*. His chief service to science consists in his having discovered the ruins of ancient Nineveh, a discovery made by him in 1843 in the course of excavations in the neighbourhood of Mosul, which he conducted with great energy and ability while acting as consular agent for the French government at that town. Proceeding from the village of Khorabab, where he made the first discoveries, he succeeded in bringing to light a large number of ancient Assyrian buildings. As the result of investigations made upon the spot he published two important works, one on the cuneiform writing of the Assyrians (*Mémoire de l'Écriture Cuneiforme Assyrienne*), and the other upon the monuments of Nineveh (*Monuments de Ninive*, five vols. folio, with drawings by Flaminio, Paris, 1846–50); the latter of which is a work of great splendour, and makes an era in Assyrian antiquities. From 1847 to 1857 Botta lived as French consul-general in Jerusalem, and from 1857 to the end of his life in the same capacity at Tripoli.

BOTTARI, GIOVANNI GAETANO, one of the most learned Roman Catholic prelates of the eighteenth century, was born at Florence in 1689; after completing his studies was admitted a member of the academy della Crusca, and intrusted with the preparation of the celebrated dictionary of that body. He laboured for six years on this work, which was published in six vols. folio. The ability which he displayed in it induced the Duke of Tuscany to give him the management of the grand-ducal printing office. He left Florence in 1730 and settled in Rome, where Pope Clement XII. appointed him professor of ecclesiastical history and polemics in the Collegio della Sapienza; the same year he was appointed palatine prelate. Shortly after he was employed with the geometer Manfredi in examining the course of the Tiber from Perugia to the mouth of the Nova, with the view of rendering it navigable, and providing a remedy against its devastating inundations. The excellent report on the subject, though signed by Manfredi, is said to have been drawn up by Bottari. As a compensation for the performance of this task, the pope appointed him keeper of the Vatican library. After living under several popes, who all treated him with favour, he died in 1775 at the advanced age of 86. His works, in addition to those already mentioned, are partly original and partly corrected editions of celebrated writings previously published. Among the former are *Lectures on Boccaccio*, *Livy*, and *Dante*; among the latter is a splendid edition of *Virgil*, with a learned preface and notes, and a corrected edition of *Vasari's Lives of the Painters*.

BÖTTIGER, KARL AUGUST, a versatile German writer, particularly distinguished as an archaeologist, born at Reichenbach, in Saxony, June 8, 1760; died at Dresden Nov. 17, 1835. After a philological course at Leipzig, he became in the first place a private tutor at Dresden, and then successively headmaster of a school at Guben, and another at Bautzen. In 1791, through the influence of Herder, he became director of the gymnasium at Weimar, and it was here that, while he enjoyed the society of Goethe, Schiller, Wieland, and other distinguished men, he began his fruitful literary career. In 1804 he removed to Dresden, where he devoted himself exclusively to archaeology. Ten years later he was appointed chief inspector of the Museum of Antiquities in that city, where he continued to reside to the end of his life. In 1832 he became a member of the French Institute. Among his most important works are: *Sabina, oder Morgenstunden einer reichen Römerin* (Sabina, oder Morning Scenes of a Wealthy Roman Lady), Leipzig, 1803; *Griechische Vasengemälde* (Paintings on Greek Vases), Weimar and Magdeburg, 1797–1800; *Ideen zur Archæologie der Malerei* (Thoughts on the Archaeology of Painting), Dresden, 1811; *Kunstmythologie* (Mythology of Art), Dresden, 1811, *Vorlesungen und Aufsätze zur Alterthumskunde* (Lectures and Essays on Archaeology), Altenburg and Leipzig, 1817; *Amalthæa* (three vols., Leipzig, 1821–25).

BOTTLES, by the ancients, were made of skins and leather; they are now chiefly made of thick glass, of the cheapest kind, and formed of the most ordinary materials. It is composed of sand with lime, and sometimes clay and alkaline ashes of any kind, such as kelp, barilla, or even wood ashes. The green colour is owing partly to the impurities in the ashes, but chiefly to oxide of iron. This glass is strong, hard, and well vitrified. It is less subject to corrosion by acids than flint-glass, and is superior to any other material for its special purpose. See GLASS.

BOTTOMRY is the hypothecation or pledge of a vessel for the payment of a debt. The creditor has no right to take possession of the ship until the expiration of the time for which the loan is made, and then (under a bottomry contract in the usual form) only by the intervention of an admiralty court. If the loan is not repaid at the stipulated time, the lender applies to an admiralty court, which (the truth of the claim being established) decrees a sale of the ship to satisfy the debt. The conditions of such a contract usually are that, if the ship is not lost or destroyed by those risks which the lender agrees to run, the debt is to become absolute. The risks assumed by the lender are usually the same as are enumerated in a common policy of insurance. If the ship is wholly lost in consequence of these risks, the lender loses his loan. In case of a partial damage, the bottomry bond usually provides that this damage shall be borne by the lender in the proportion of the amount loaned to the value of the ship. If this amount is equal to one-half of the value of the ship, the lender is to bear one-half of the amount of such loss, &c. As the lender thus assumes a certain risk, he is justly entitled to a greater interest than if he did not thus take the hazard of the loss of the whole loan; and this is called *marine interest*. He is entitled to the usual rate of interest on his loan, in addition to the usual premium of insurance for the same voyage or period. The stipulation for such a rate of marine interest is not a violation of the laws against usury, for it is not merely a compensation for the use of the money lent, but also for the risk assumed. The ship-owner may borrow money on bottomry, whether his vessel be in port or at sea. But the captain of the ship, as such, cannot so borrow when

in the port where the owner resides, or near enough to consult him on any emergency. In any other port he may pledge the ship on bottomry for the purpose of raising money necessary for repairing, supplying, and navigating her, if he can obtain it in no other way. If he borrow thus without necessity the bond is void, and the lender can look only to the personal responsibility of the captain.

BOTZEN, or **BOLZANO**, a town of Austria, in Tyrol, 54 miles s. of Innsbruck, at the confluence of the Talfer with the Eisack. It is a well-built flourishing town, surrounded by a wall 2 miles in length, built to protect it from a mountain torrent close by. The parish church is a Gothic building of the fourteenth century, with an elegant spire; adjoining it is the new cemetery. The other objects worthy of notice are: the church of St Nicholas, a gymnasium, custom-house, two monasteries, a normal school, and a nunnery. It has some silk and woollen manufactures, tanneries, dyes-works, &c. Botzen has an important transit trade, and has four annual fairs, resorted to by commercial travellers from all parts of Italy and Germany. In the environs wine and fruits are produced. Pop. in 1900, 13,632.

BOUCH, Sir **THOMAS**, civil engineer and constructor of the first Tay Bridge, was born at Thursley, Cumberland, on Feb. 22nd, 1822. He was early attracted to engineering studies, and in 1839 began his apprenticeship to a civil engineer in the north of England. He was a resident engineer on the Stockton and Darlington Railway for a period of four years, and in 1849 went to Scotland as manager and engineer of the Edinburgh and Northern Railway. While in the service of this company he devised a sort of floating railway for carrying goods trains across such estuaries as those of the Forth and Tay. After this he was for a time engaged in railway construction in England. He was engineer of the first railway bridge across the Tay, which was completed in Sept., 1877, and opened in May of the following year. For this he received the freedom of Dundee, and in 1879 the honour of knighthood. On Dec. 28th of that year the bridge gave way during a stormy night, at the time when a train with some seventy passengers was crossing. All were drowned, and the accident caused such severe mental distress to Sir Thomas Bouch that it undoubtedly hastened his death. He died at Moffat on Oct. 30th, 1880.

BOUCHARDON, **EDME**, a French sculptor, was born in 1698 at Chaumont-en Bassigny. In order to devote himself to statuary he went to Paris, and entered the school of the younger Conston. He soon gained the highest prize, and was made royal pensioner at Rome. The Duke d'Antin recalled him to Paris, and gave him a studio at the Louvre. He assisted in repairing the fountain of Neptune at Versailles, and executed ten statues which adorn the Church of St. Sulpice. The fountain in the Rue de Grenelle, which the city of Paris ordered to be constructed in 1739, was made by him, and is considered his master-piece. The execution of the greatest monument of that period, the equestrian statue of Louis XV., which was erected by order of the city of Paris, was committed to him. He laboured twelve years on this with inconceivable perseverance, and has left in the horse a model which may be ranked with any work of antiquity. He died at Paris on July 27th, 1762. His pieces bear the character of simple grandeur, but, in general, more fire is to be desired in his sculpture. Latterly he adopted a more polished, delicate manner, to suit the taste of the age. Caylus has written his life.

BOUCHER, **FRANÇOIS**, French painter, and director of the Academy of Painters, was born at Paris on Sept. 29th, 1703, and died on May 30th, 1770.

While a pupil of the celebrated Lemoyne, he gained at the age of nineteen the first prize of the Academy. He produced with remarkable facility, and his sketches alone amounted to more than 10,000. He also etched some plates, and many of his paintings have been engraved. Some of his more important works are: *L'Annore et Céphale*; *Diane Sortant du Bain*; *Femme Couchée*; *Le But*; *Le Repos en Égypte*; &c.

BOUCHES-DU-RHONE ('Mouths of the Rhone'), a department in the s. of France, in the ancient government of Provence, bounded n. by Vaucluse, w. by Gard, e. by Var, and s. by the Mediterranean. Chief town, Marseilles. Area, 1971 square miles, of which about one-half is under cultivation, the remainder being occupied by forests, heaths, wastes, water, &c. Between the Rhone and the lagoon of Berre is the great plain of La Crau. Its borders are tolerably well cultivated, and support a number of cattle; but the centre is little better than a desert of stones and pebbles, affording, however, winter pasture for sheep. The Rhone is the principal river—near Arles it divides into two branches, which inclose an island called La Camargue. Several canals facilitate transport, and are especially useful for irrigation. The climate is generally very warm, with little rain during the summer. A cold and generally violent wind, called mistral, always blows from the Cevennes after rain. It lasts from three to nine, sometimes, though rarely, even twelve days, and dries up the ground with astonishing rapidity. The soil of the department is for the most part arid and unproductive, without irrigation. Vines, however, thrive, and almonds, figs, capers, nuts, and particularly olives, are extensively cultivated. The minerals are of little commercial importance. Salt is extensively manufactured from the lagoons, and the salt-works of Berre are celebrated both for the quality and quantity of their produce. The articles manufactured, besides salt, are principally soap, brandy, olive-oil (the best in France), soda, chemicals, vinegar, scents, leather, glass, &c. The fisheries are productive. The department includes the three arrondissements of Marseilles, Aix, and Arles. Pop. in 1886, 604,857; in 1896, 673,820.

BOUCICAULT, **DION**, a dramatic author and actor, was born at Dublin, Dec. 26th, 1822, and died at New York, Sept. 18th, 1890. He was educated partly at Dublin and partly at London University. It was intended that he should follow the profession of an architect, but the successful production in 1841 of his five-act comedy called *London Assurance* determined his subsequent career. In 1844 he repeated his previous success with the play of *Old Heads and Young Hearts*, while in 1852 he himself made his first appearance as an actor in a piece called *The Vampire*. Being a remarkably facile writer, he soon produced quite a lengthy list of plays, and his success was as great in the United States as in Britain. In 1860 he began to produce a new style of drama, the incidents of which were largely sensational. The best examples of his work in this style were the Irish dramas *The Colleen Bawn* (1860), *Arrah-na-Pogue* (1864), and *The Shaughraun* (1875). In the latter drama he frequently played the part of Conn, and his last appearance on the stage was in 1887, in a play called *The Jilt*. As an actor he had a certain easy cleverness, and as the author of nearly 150 adaptations and dramatic pieces he will be remembered chiefly for the lightness, the sentiment, the rollicking fun, and the tragic interests of his dramatization of Irish life.

BOUFFLERS, **LOUIS FRANÇOIS**, **DUC DE**, Marshal of France, one of the most celebrated generals of his age, was born in 1644; died 1711. He was an *admiral*

of the great Condé, of Turenne, Crequi, Luxembourg, and Catinat. His defence of Namur in 1695, and of Lille in 1708, are famous. The siege of the former place was conducted by King William in person, and cost the allies more than 20,000 men. The latter was conducted by Prince Eugene. An order was sent from Louis XIV., signed by his own hand, commanding Boufflers to surrender; but he kept it secret, until all means of defence were exhausted. The retreat of the French after their defeat at Malplaquet, under the direction of Boufflers, was more like a triumph than a defeat.

BOUFFLERS, STANISLAUS, CHEVALIER DE, member of the French Academy, son of the Marchioness of Boufflers, mistress of Stanislaus, King of Poland, born at Lunéville, 1737. He entered the army, was soon appointed governor of Senegal, and, while in this office, made many useful regulations. After his return he devoted himself to that light kind of literature which distinguished the age of Louis XV. His reputation gave him a seat in the States-general, where he was esteemed for his moderation and his good intentions. After August 10, 1792, he left France, and met with a friendly reception from Prince Henry of Prussia, at Reinsberg, and Frederick William II. A large grant was made to him in Poland for establishing a colony of French emigrants. In 1800 he returned to Paris, where he devoted himself to literary pursuits, which, in 1804, procured him a seat in the French Institute. He died Jan. 18, 1815. He lies buried near the Abbé Delille, and on his tomb is this inscription, written by himself, and characteristic of his lively disposition: *Mes amis, croyez que je dors.* His works were published in eight vols 12mo, 1815. His mother was long the ornament of the court of Stanislaus, during its residence at Lunéville, by the graces of her mind and beauty of her person. Voltaire addressed to her a madrigal which finishes thus:

'Si vous ensemble vécû du temps de Gabrielle
Je ne sais pas ce qu'on eût dit de vous,
Mais on n'aurait point parlé d'elle.'

She died in 1787.

BOUGAINVILLE, LOUIS ANTOINE DE, Count of the Empire, senator, and member of the Institute in 1796, was born in 1729 at Paris; died at the same place, 1811. At first a lawyer, afterwards a distinguished soldier, diplomatist, and scholar, he was always remarkable for his energy of character. He fought bravely in Canada under the Marquis of Montcalm, and it was principally owing to his exertions, in 1758, that a body of 5000 French withstood successfully a British army of 16,000 men. Towards the conclusion of the battle he received a shot in the head. The governor of Canada, finding himself unable to defend the colony, sent Bougainville to France for reinforcements. He set off in November, 1758, and returned January, 1759, after the king had made him colonel and knight of St. Louis. After the battle of September 13, 1759, in which Montcalm was killed, and the fate of the colony decided, Bougainville returned to France, and served with distinction under Choiseul Stainville, in the campaign of 1761, in Germany. After the peace he entered the navy, and became one of the greatest naval officers in France. He persuaded the inhabitants of St. Malo to fit out an expedition for the purpose of establishing a colony in the Falkland Islands, and undertook the command of the expedition himself. The king appointed him captain, and Bougainville set sail with his little fleet in 1763. But as the Spaniards had a prior claim to the islands, France was obliged to surrender them, and Bougainville's having returned to France, was commissioned to

carry the surrender into execution on receiving from Spain a remuneration for his expenses. For this purpose he set sail with one frigate and a merchant ship from St. Malo, Dec. 15, 1768. After the immediate object of his voyage was accomplished, he circumnavigated the world and returned to St. Malo, March 16, 1769. He enriched the science of geography by a number of new discoveries. In the American war he commanded several ships of the line with great honour; was in 1778 *chef d'escadre*, and in the following year field-marshal in the land forces. After 1790 he devoted himself to science.

BOUGIES (the French word for *tapers*), in surgery applied to certain smooth cylindrical rods which are introduced into the canals of the human body in order to widen them, or more rarely to apply mellements to a particular part in the interior of the body. They are distinguished from catheters by being quite solid, while the latter are hollow and open at the ends for the purpose of affording a passage to fluids. Bougies are generally pointed at one end, and grow gradually thicker towards the other end, but in some cases they are of the same thickness throughout their whole length, the ends being only rounded off. They are made sometimes of linen dipped in wax and then rolled up, sometimes of a kind of plaster and linen, also of caoutchouc or gutta-percha, or of metal, such as lead, silver, or German silver.

BOUGUER, PIERRE, born at Crisic, in Brittany, in 1698, studied the elements of mathematics under his father, who was an able hydrographer, and is well known as the author of an excellent Treatise on Navigation. He was soon master of all that his father could teach him, and in 1727 gained a prize proposed by the French Academy for the best essay on the masting of vessels. He gained similar prizes in 1729 and 1731, and added still more to his fame by a work of consummate ability entitled *Traité de la Gradation de la Lumière*, in which he endeavours to ascertain the quantity of light absorbed by transparent bodies, explains the construction of several ingenious instruments which he had invented for the purpose of facilitating such investigations; and maintains that the light of the sun is more intense at its centre than on the edges of its disc, while in the moon the reverse is the case. About this time the figure of the earth was the subject of frequent discussion in the Academy of Sciences; and for the purpose of ascertaining exactly how much it was elevated at the equator and flattened towards the poles, it was proposed to measure the length of a degree at each of these positions, and at the same time make other observations and experiments of importance to astronomy and navigation. An expedition was accordingly fitted out, in which Bouguer was associated with Godin and La Condamine. The main burden of the task fell upon Bouguer, who executed it with consummate ability, and published the results in a work entitled *Théorie de la Figure de la Terre*. Unfortunately, he had become suspicious of La Condamine, and had not hesitated to charge him with wishing to appropriate a much larger share of the honour of the work than belonged to him. The general impression is that this charge is not well founded, and Bouguer by making it only involved himself in a quarrel which embittered the latter part of his life, and probably hastened his death, which took place in 1758.

BOUILLE, FRANCIS CLAUDE AMOUR, MARQUIS DE, one of the most celebrated of the generals of Louis XVI., was born in 1739 at Auvergne. He distinguished himself in the Seven Years' war, and was appointed governor of Guadaloupe in 1768, and conquered Dominica, St. Eustatia, Tobago, St. Christopher, Nevis, and Montserrat. After the

Peace of 1788 he returned to Paris, and was appointed Lieutenant-general. He afterwards travelled in England, through Holland, and a great part of Germany, until he was made chief of the province *Trois Evêchés*. In the Assembly of Notables (1787-88) he declared for the proposed reforms of Calonne, which, however, were defeated by Cardinal Brienne. He was opposed to the plan of Necker for the union of the provinces. At the breaking out of the revolution he supported the existing government, both in his former province and in Lorraine, Alsace, and Franche Comté. It was only at the urgent desire of the king that he swore allegiance to the constitution of 1791. He repressed in 1790 the rebellion of the garrisons of Metz and Nancy, and although the National Assembly decreed him a vote of thanks for the bravery and ability he had displayed on this occasion, still the revolutionists distrusted him. Shortly afterwards he made preparations to assist Louis XVI in his escape. Bouillé had made his arrangements well, and had not the king forbidden any bloodshed, he would certainly have rescued him. Being thus compelled to leave the king at Varennes to his fate, he fled from the dangers to which he himself was exposed by the attacks of the revolutionists. From Luxembourg he wrote a threatening letter to the National Assembly, and then exerted himself to excite the foreign powers against the Republic. He succeeded well at Vienna, gained over Gustavus III., and obtained the promise of 30,000 men from the Empress Catherine II., to be put under the command of the King of Sweden and the French general. But Gustavus was murdered, the empress forgot her promises, and Bouillé went over to England in 1796. Here he wrote his *Memoirs of the Revolution*, which appeared in an English translation (London, 1797), and, after his death, in the original. Bouillé died at London in 1800.

BOUILLON, originally a German duchy, now a large district in Belgium, 9 miles wide and 18 long on the borders of Luxembourg and Liège. This woody and mountainous tract consists of the town of Bouillon, with 2800 inhabitants, and twenty five villages, with 20,000 inhabitants. The town was once the capital of the duchy of the same name. This ancient place lies in the midst of hills, on the left bank of the Semois, which abounds with fish, 40 miles from Liège and 8 from Sedan. It has a strong castle upon a rock, which however is commanded by the neighbouring mountains. Godfrey of Bouillon once possessed the dukedom of this name. He was Duke of Lower Lorraine, and Bouillon was bestowed upon him as belonging properly to the county of Ardenne. In order to supply himself with funds for his expedition to the Holy Land Godfrey mortgaged his duchy of Bouillon in 1095 to the Bishop of Liège. After the estate had been held for many years by the bishopric, the houses of La Marck and La Tour d'Auvergne laid claims to Bouillon, but in 1641 relinquished their pretensions to the Bishop of Liège for 150,000 Brabant guilders. In the war of 1672 France conquered Bouillon, and Louis XIV. gave it in 1678 to the Chevalier La Tour d'Auvergne his chamberlain. After this time it belonged to the house of La Tour until the revolution, when it was taken from them in 1792. The last possessor, Godfrey Charles Henry de La Tour d'Auvergne, died December, 1812. By the Peace of Paris, in 1814, the dukedom was included in that of Luxembourg which had fallen to the King of the Netherlands. The title of Prince of Bouillon was assumed in 1792 by Philip d'Auvergne, captain in the British navy, and he continued to bear it till his death in 1816. The congress which met at Vienna in 1815 appointed commissioners to investigate the comparative claims of this nobleman and Prince

Charles of Rohan. They decided in favour of the latter. By him it was sold to the Netherlands in 1821, and on the division of the kingdom at the revolution of 1830 it fell to Belgium.

BOUILLON, the name of one of the most distinguished historical families of France. The last Duke of Bouillon of the first line had sold the duchy to the Bishop of Liège, but a new line arose towards the end of the fifteenth century. It originated with a cadet of the house of Marck, which, at the commencement of the fifteenth century, possessed the principality of Sedan. In 1482 William de la Marck, well known by the name of the Boar of Ardenne, seized the territory of Bouillon, belonging to the bishopric of Liège, and conferred it on his brother Robert. The Bishop of Liège attempted by force to regain it, but this Robert, and a son of the same name who succeeded him, were successful in resisting, and at the end of the war, which was brought to a close in 1492 by the mediation of the King of France, Robert the younger remained virtually, if not formally, Lord of Bouillon. The third Robert succeeded his father last mentioned, and having, like his predecessors, entered the service of France, was made prisoner with Francis I. at the battle of Pavia. He afterwards obtained a marshal's baton, and under the name of Marshal de Fleuranges, which was the title he assumed, is known as the author of very curious memoirs. Robert IV., son of Robert III., appears to have been temporarily dispossessed by the Bishop of Liège, but recovered possession, and not only became Marshal of France, but received the title of duke, and thus became the first Duke of Bouillon of the new line. He was taken by the Spaniards at the siege of Hesdin in 1553, and three years after, when he had been liberated on his parole for the purpose of procuring the 60,000 crowns at which his ransom had been fixed, died by poison. His wife was a daughter of the celebrated Diana of Poitiers. His son, Henry Robert, lost Bouillon, which, by the treaty of Châteaublanc, returned to the Bishop of Liège, but he still preserved the title, and transmitted it to his son William Robert, who died in 1588 without having married. The male line thus became extinct. He was survived by a sister, who married Henri de La Tour d'Auvergne, viscount de Turenne, but died without children in 1594. She had, however, bequeathed her possessions to her husband, and thus the two powerful houses of Turenne and Bouillon were merged into one. This new Duke of Bouillon was one of the most distinguished personages of his time. He was at first devotedly attached to Henry IV. while he was fighting his way to the throne, but afterwards leagued with his enemies, and being implicated in the conspiracy which cost Marshal Biron his life, was long obliged to live in exile. He was restored to favour in 1608, and figured much during the intrigues in the subsequent part of the following reign, and having embraced the doctrines of the Reformed Church, became one of its most distinguished leaders. He died in 1623, leaving two sons the younger of whom was the celebrated Marshal Turenne. The elder, named Frédéric Maurice, after serving with distinction in the Low Countries, returned to France, became a Roman Catholic, served Louis XIII., then joined the insurrection against him headed by the Count of Soissons, and helped him to gain the battle of Murfée. During the Fronde he joined the princes, and took a prominent part in the civil war, but was reconciled to the court in 1651, obtained the title of prince, and received large accessions of territory in exchange for the principality of Sedan. He died in 1682, leaving interesting memoirs of his life and times. He was succeeded by Godafroi Maurice, who figured much

in the wars of the period, and became great chamberlain to Louis XIV., and who died in 1721. One of his brothers was the celebrated Cardinal de Bouillon, who was born in 1644, obtained the cardinalate when only twenty-six years of age, was long the representative of the Gallican Church at Rome, made himself notorious by his vanity, ambition, and intriguing spirit, and died in 1715.

BOULAINVILLIERS, HENRI DE, born at Saint Saire in Normandy, in 1658, studied at the College of Juilly, entered the army, but shortly after became devoted to historical and antiquarian pursuits. He wrote a number of works in connection with the history of France, but is perhaps best known by his *History of Mohammed*, in which he writes in a very oriental style, lands the impostor, and seems almost disposed to become a believer in the Koran. He is said to have been much addicted to astrology. He died in 1722.

BOULDER CLAY. See GEOLOGY—Post-Tertiary or Quaternary Epoch.

BOULEVARD (in old French *Boulevard*), a word derived from the German *Bollwerk*, which is the same as the English bulwark. The word was formerly applied to the ramparts of a fortified town, but when these were levelled, and the ditches belonging to them filled up, and the whole planted with trees and laid out as promenades, the name boulevard was still retained, and thus came to have its present signification. The most famous boulevards are those of Paris, especially those which, in the time of Louis XIV., took the place of the fortifications on the N. side of the city, and became first a promenade and then a street. Modern usage has applied the word to many streets which were not originally ramparts, but which have been cut through the older and denser parts of the town, or have been laid out in the new quarters. All that the more modern boulevards have in common with the older ones is that they are broad and are planted with trees. The modern boulevards are for the most part situated at some distance from the bustle of the town, and are therefore less frequented than the older ones, which are in the very heart of the city, and in the neighbourhood of the chief resorts of amusement and pleasure. See PARIS.

BOULOGNE, a seaport of France, department Pas de Calais, at the mouth and on the right bank of the Liane, with the suburb of Capécure on the left. The town proper consists of an upper and lower town. The former is surrounded with old and well-planted ramparts; the latter, which is the business part of the town, has straight and well-built streets, and is semi-English in character, many of the signboards being in English, the shops having an English air, and much English being spoken. The Church of Notre Dame (begun in 1827, consecrated in 1886) has a magnificent high altar, and a crypt, part of which dates from the twelfth century. Among the churches, some of which are handsome edifices, there are several for the English population. The castle, which dates from 1231, is a massive structure, communicating with the upper town by a bridge. It serves at present as a barrack and artillery dépôt. Here Louis Napoleon was imprisoned in 1840. Other noteworthy buildings are the Hôtel de Ville, the Palais de Justice, the large and handsome bathing establishment, the library of 50,000 volumes, the museum of natural history and antiquities, the custom-house, the exchange, &c. Boulogne carries on various industries, is one of the chief French seaports, and is a great fishing centre, giving employment to about 5000 hands. Extensive improvements in its accommodation for shipping are being carried out or projected. There is a large passenger traffic between Boulogne and Folkestone. Steam-

Vol. II.

boats daily run between this place and England. Boulogne still exhibits some Roman remains. The Northmen took it in 863, and massacred the inhabitants. In 1544 the town was taken by Henry VIII. of England, after a siege of six weeks. The English retained it till 1550, when Edward VI. sold it to France for 400,000 crowns. The Emperor Charles V. demolished it in 1563. During the first republic Boulogne received the name of Port de l'Union. With a favourable wind vessels can reach the coast of England in two or three hours from this place. Bonaparte, therefore, ordered the harbour to be made deeper, and a number of vessels to be built, in order to transport the army intended for the invasion of England, and some small forts and batteries to be erected, in order to strengthen the harbour and the town. A large army remained here for many months in a camp, which almost resembled a town, waiting to embark; but, upon the breaking out of hostilities with Austria, 1805, they were called to other places. Pop. in 1886, 30,084, about a tenth being English; in 1901, 49,083.

BOULOGNE, BOIS DE. See BOIS DE BOULOGNE.
BOULTON, MATTHEW, a celebrated engineer, was born at Birmingham in 1728. After being educated at a grammar school, he was instructed in drawing by Worlidge, and he also studied mathematics. He engaged in business as a manufacturer of hardware, and, as early as 1745, he is said to have invented and brought to great perfection inlaid steel buckles, buttons, watch-chains, &c., of which large quantities were exported to France, whence they were repurchased with avidity by the British, as 'the offspring of French ingenuity.' In 1763 Boulton finding his manufactory at Birmingham too confined for his purposes, purchased a lease of the Soho, about 2 miles distant, in the county of Stafford. This spot, then a barren heath, was gradually converted into an extensive manufactory and school of the mechanical arts, where ingenious men found ample employment for their talents from the liberal patronage of the patriotic proprietor. The introduction of that important machine, the steam-engine, at Soho, led to a connection between Boulton and James Watt, of Glasgow, who became partners in trade in 1769. He died at Soho, Aug. 17, 1809.

BOUNTY, in political economy, is a reward or premium granted to particular species of trade or production. The general subject of encouragement of domestic, in competition with foreign, industry or trade (which is one species of industry), will be treated of under other heads, and only those circumstances mentioned, in this place, which distinguish bounties from other species of encouragement. And it is to be observed, in the first place, that the general principle is the same, whether the encouragement is given to a particular species of education, as that in the clerical profession, which has been the subject of encouragement, direct or indirect, time immemorial; or education in general; or a particular kind of literary productions, as the best poetical composition; or a treatise on some scientific subject, as one on light and heat; or to some agricultural or manufactured product, as in the case of the premiums formerly granted by England on the exportation of wheat, and those given by agricultural societies in America, for the greatest production of any kind of grain on a given extent of land, or the best threshing or winnowing machine, &c. In all these instances, the general doctrine is assumed and presupposed, that the successful direction of talent or industry to the species of art or mode of production indicated will be beneficial to the public. The utility of the bounty will depend upon the correctness of this assumption.

All bounties or premiums are not offered for the encouragement of domestic talent and industry to the exclusion of foreign competition. Many of those offered by the British and French governments, and by private associations, are held out to all competitors indiscriminately; and where the object is universal improvement, this is one of the appropriate modes of encouragement, though others concur with it, such as the monopolies of copyrights and patents, and the honours and distinctions conferred on those who make any important improvement. One other class of cases may, properly enough, be made the subjects of bounties or premiums; namely, the productions of extraordinary efforts of ingenuity and skill. A competition is in this way excited, by which none suffers, and all the effects of which are beneficial to a community. There is one other class of cases in which nations have offered bounties; namely, to species of industry in the prosecution of which the national security is supposed to be, in some measure, involved. The support of the British navy, for instance, was supposed to depend, in some degree, upon the fisheries, since these were considered to be one of the great schools of seamen. The British government was therefore induced to encourage this species of industry by the offer of liberal bounties. This idea has proved, however, to be an utter fallacy. The generality of the boats employed in the herring-fishery during the existence of the bounty system, instead of being manned by regular fishermen, were, for the most part, managed by small farmers, tradesmen, and others, whom the temptation of the bounty thus allured from their regular occupations to follow what was little better than a gambling speculation. Bounties are a more expensive mode of encouragement than duties and prohibitions, as the money must be first collected by a tax, and then distributed in bounties—a process in which a loss of from two to twenty per cent. is sustained. Of the inutilty of bounties in general, the British government has long been persuaded. The bounty on the exportation of corn was repealed in 1815; and the bounties on the exportation of linen, &c., along with the bounty on herrings, ceased in 1830.

BOUNTY, a premium offered by government to induce men to enlist in the public service, especially, the sum of money given in some states to recruits in the army and navy. This system is, of course, only practised in those countries where military or naval service is voluntary, such as our own country or America. The amount of the bounty offered varies with the difficulty of procuring volunteers, and is naturally at its lowest in time of peace. The highest bounty offered in our own country was during the time of the wars with Napoleon, when it rose to about £24. During the late civil war in America the bounty was at one time so high as \$500 (£100). The policy of giving bounties is by many thought to be a very questionable one. In the British army it had the tendency of inducing men to desert, in order to enlist again in other regiments, and thus receive new bounties. In the navy, too, as it tends to increase the wages of seamen in the mercantile marine, its operation is considered injurious. The bounty given to army recruits in Great Britain was abolished by the Army Enlistment Act of 1870.

BOURQUETIN. See **IBEX**.

BOURBON. The founder of this family, which has governed France, Spain, the Two Sicilies, Lucca, and Parma (which see), was Robert the Strong, who, in 861, became Duke of Neustria, and in 866 lost his life in a battle against the Normans. Some trace his descent from Pepin l'Heristal, others from a natural son of Charlemagne, and others from the kings of Lombardy. It is certain that the two sons

of this Robert were kings of France. The elder, named Eudes, ascended the throne in 888, and died in 898; the younger, Robert, in 923, and died in 923. The eldest son of this Robert was Hugh the Great, duke of the Isle of France, and count of Paris and Orleans. Hugh Capet, son of Hugh the Great (great grandson of Robert the Strong), founded the third French dynasty in 987. (See **CAPET**.) One of his descendants, named Robert, was the root of the elder line of the dukes of Burgundy, which became extinct in 1361. A descendant of this Robert, Henry of Burgundy, was first regent of Portugal in 1095, where his legitimate descendants became extinct in 1383. Pierre de Courtenay, a descendant of Hugh Capet, in the fifth generation, was father and ancestor of many emperors of Constantinople. The house of Anjou, which was descended from Hugh Capet, in the eighth generation, possessed the throne of Naples for two centuries, and for some time that of Hungary. Another descendant of Hugh Capet, in the tenth degree, founded the house of Navarre, which continued from 1238 to 1425. A second family of Anjou, descended from Hugh Capet, in the thirteenth degree, gave some distinguished princes to Provence. In the same degree, the younger line of the powerful dukes of Burgundy derived its origin from him. This line became extinct with the death of Charles the Bold, in 1477, whose successor, Maria, married Maximilian, archduke of Austria, and became grandmother of Charles V. Robert, earl of Clermont, second son of St. Louis, married Beatrice, duchess of Bourbon. In this way the city of Bourbon l'Archambault, or Bourbon les Bains, in the department of Allier (formerly *Bourbonnais*), became the birthplace of the house of Bourbon, and Louis I, duke of Bourbon, son of Robert and Beatrice, its founder. Two branches took their origin from the two sons of this Louis, duke of Bourbon, who died in 1341. The elder line was that of the dukes of Bourbon, which became extinct at the death of the Constable of Bourbon in 1627, in the assault of the city of Rome. The younger was that of the counts of La Marche, afterwards counts and dukes of Vendôme. Of these, Charles, duke of Vendôme, who died in 1537, and who had been the head of the house of Bourbon since the death of the Constable, had two sons, Anthony and Louis, founders respectively of the royal line of Bourbon, and of the line of Condé. Henry, the son of Anthony, obtained the throne of France as Henry IV. (see **HENRY IV.** of France), when the house of Valois became extinct in 1589 by the murder of Henry III. His father had obtained the kingdom of Navarre through his wife, who inherited it, and Henry now added it to the French dominions. Anthony's younger brother, Louis, prince of Condé, was the founder of the line of Condé. There were, therefore, two chief branches of the Bourbons—the royal, and that of Condé. The royal branch was divided by the two sons of Louis XIII., the elder of whom, Louis XIV., continued the chief branch, which, through his son Louis (the dauphin) and grandson Philip V., was separated into the elder or royal French branch, and the younger or royal Spanish branch; whilst Philip, younger son of Louis XIII., founded the house of Orleans, when he received the duchy of Orleans from Louis XIV. The kings of the elder or French line of the house of Bourbon run in this way:—HENRY IV. Louis XIII. XIV. XV. XVI. XVII. XVIII., and Charles X.—The house of Bourbon consists of the following branches and members:—

A. The elder French royal line of Bourbons as distinguished from the younger branch or house of Orleans. The last sovereigns of this line were the three brothers, Louis XVI., Louis XVIII., and

Charles X. (Louis XVII., son of Louis XVI., never obtained the crown), all of whom were grandsons of Louis XV. Louis XVIII. had no children, but Charles X. had two sons, viz. Louis Antoine de Bourbon, duke of Angoulême, who was dauphin till the revolution of 1830, and died without issue in 1844, and Charles Ferdinand, duke of Berry, who died, 14th Feb. 1820, of a wound given him by a political fanatic. The Duke of Berry had two children, (1) Louise Marie Thérèse, called Mademoiselle d'Artois, and afterwards by marriage Duchess of Parma, died at Venice 1st Feb. 1864; and (2) Henri Charles Ferdinand Marie Dieudonné, born in 1820, and at first called Duke of Bordeaux, but afterwards called Count de Chambord. His mother was the Princess Caroline, daughter of Francis I., king of the Two Sicilies. Charles X. having abdicated in favour of his grandson Henri above mentioned in 1830, and the dauphin having renounced his claims on the French throne also in favour of the latter, the Count de Chambord was until his death looked upon by his party as the legitimate heir to the crown of France, and was styled by them Henri V.

B. The branch of the Bourbons known as the House of Orleans. This branch, which was raised to the throne of France by the revolution of 1830, and deprived of it by that of 1848, derives its origin, as already mentioned, from Duke Philip I. of Orleans (died 1701), second son of Louis XIII., and only brother of Louis XIV. By his second wife, Charlotte of the Palatinate, he left as his successor in the dukedom his son Philip, who was known as Duke of Chartres during his father's lifetime, and was regent of France during the minority of Louis XV. Philip, second duke, was succeeded by his son Louis Philip (born 1703), who married a princess of Baden, and died in retirement in 1762, leaving a son of the same name, Louis Philip, duke of Orleans, who was born in 1725, and died in 1785. The son of the last-mentioned duke was Louis Joseph Philip, the duke of Orleans whose name figures in the first French revolution, who perished on the scaffold in 1793, after he had laid aside his princely name the year before and assumed that of 'Citizen Egalité'. He left four children: 1, Louis Philip, before the revolution duke of Chartres, after his father's death duke of Orleans, from 1830 to 1848 king of France, died 26th Aug. 1850, leaving a numerous family; 2, The Duke of Montpensier, who died in England in 1807; 3, The Count de Beaujolais, who died at Malta in 1808; and 4, a daughter, Adelaide, Mademoiselle d'Orleans, born in 1777, died 31st Dec. 1847. The eldest son of King Louis Philip was Ferdinand, duke of Orleans, born in 1810, died in 1842, who married a daughter of Frederick Louis of Mecklenburg-Schwerin, and left two sons: 1, Louis Philip, count de Paris, born at Paris 24th Aug. 1838; and 2, Robert, duke of Chartres, born at Paris in 1840. Louis Philip having abdicated in favour of the former in 1843, the Count de Paris till his death in 1894 was looked upon by the Orleansists as the true heir to the throne. He was married to his cousin Isabella, a daughter of the Duke of Montpensier, and left issue.

C. The Spanish-Bourbon dynasty. In 1700 Louis XIV. placed his grandson Philip, duke of Anjou, on the Spanish throne, who as Philip V. founded the Bourbon dynasty in Spain. Philip V. was succeeded in 1746 by his son Ferdinand VI., who, dying in 1759 without heirs, was succeeded by his brother Charles III. To him succeeded (1788) his son Charles IV., who, in 1808, resigned the throne in favour of a successor nominated by Napoleon, and died at Naples in 1819. His son Fernando, prince of the Asturias, obtained the crown on the fall of Napoleon, and reigned as Ferdinand VII., dying

on 29th Sept. 1833, and leaving behind him two daughters by his third marriage, the elder of whom succeeded him as Isabella II. She was married, in 1846, to her cousin Francisco de Asia. In 1868 she had to leave Spain in consequence of the revolution, and in 1870 she renounced her claims to the throne in favour of her son Alphonso, who became Alphonso XII., and died in 1885, his son, Alphonso XIII., succeeding him.

D. The royal line of the Two Sicilies. The Two Sicilies being then a possession of the Spanish monarchy, in 1735 Don Carlos, the younger son of Philip V. of Spain, obtained the crown and reigned over Sicily and Naples as Charles III. In 1759, however, he succeeded his brother Ferdinand VI. on the Spanish throne, when he transferred the Two Sicilies to his third son Fernando (Ferdinand IV.), on the express condition that this crown should not be again united with Spain. Ferdinand IV. had to leave Naples in 1806; but after the fall of Napoleon he again became king of both Sicilies under the title of Ferdinand I. He was succeeded by his son Francis I. in 1815; Francis was succeeded by his son Ferdinand II. in 1830; and the latter was succeeded by his son Francis II. in 1859, who was deprived of the kingdom in 1860.

E. The dual line of Parma. This line, like that of the Two Sicilies, was founded by a son of Philip V. of Spain, viz. Don Philip, his youngest son, who obtained the duchies of Parma and Piacenza in 1748. Louis, grandson of Don Philip, obtained Tuscany likewise (1802), with the title of King of Etruria. The family did not long retain this honour, however, being soon forced by the power of France to give up not only Etruria, but also Parma and Piacenza; and it was not till 1847 that there was again a Bourbon Duke of Parma. In 1859 the reigning duke, Robert, had to leave his dominions, which were soon incorporated in the kingdom of Italy. See *Histoire du Bourbonnais et des Bourbons*, by Collier Demoret (Paris, 1824), two vols.; and *Achaintre's Histoire Chronologique et Généalogique de la Maison Royale de Bourbon* (Paris, 1825-26), two vols.

BOURBON, CHARLES, DUKE OF, or CONSTABLE OF BOURBON, son of Gilbert, count of Montpensier, and Clara of Gonzaga, was born in 1489; received from Francis I. in the twenty-sixth year of his age, the sword of Constable. By the coolness with which he faced death in posts of the greatest hazard he excited the admiration of his fellow-soldiers. When viceroy of Milan he won all hearts by his frankness and affability. His fame was not yet tarnished when the injustice of his king deprived him of his offices, banished him from France, and brought the family of Bourbon into disgrace, in which state it continued until the conclusion of the reign of Henry III. Some historians declare that the Duchess of Angoulême, mother of Francis I., had fallen in love with the young constable, and could not endure the contempt with which he treated her passion: others relate that, influenced by avaricious motives, she laid claim to the estates of Charles of Bourbon, and obtained possession of them by a judicial process. Whatever may be the true cause of her conduct, it is certain that she strove to invalidate a formal donation of Louis XII. The constable, enraged at seeing himself deprived of his estates by the mother of the king whom he had served with so much fidelity and zeal, listened to the proposals made him by Charles V. and the King of England. He experienced the usual fate of deserters: he was well received while his services were needed, but narrowly watched to secure his fidelity. Exposed as he was to the contempt of the Spanish nobility and the jealousy of the generals of Charles V., nothing remained to him but his courage and repentance. His ability, how-

ever, induced the emperor to bestow upon him the command of an army, and to treat him with honour. He was already beyond the confines of France, when Francis I. sent to demand the sword which he bore as constable, and the badge of his order. His answer displays the anguish of his heart—"The king took from me my sword at Valenciennes, when he gave to D'Alençon the command of the vanguard, which belonged to me; the badge of my order I left under my pillow at Chantelles." His flight was a misfortune to France; the expedition of Francis into Italy was arrested. Having been appointed to the command of the imperial troops, he made an unsuccessful attack upon *Marseilles*, but contributed greatly to the victory of *Pavia*. When Francis was carried a prisoner to Madrid he went there in person, that he might not be forgotten in the treaties between the two monarchs; but Charles V. delayed concluding them, and Bourbon discovered that he could not trust the emperor, who had even promised him his sister in marriage. Compelled to smother his resentment he returned to Milan, maintained possession of Italy by the terror of his arms, and obtained so much authority as to become an object of suspicion to the emperor, who, in order to weaken him, refused to grant him the necessary supplies. In order to prevent the dispersion of his army he led the soldiers to the siege of *Rome*, the plunder of which city he promised them. He was the first to mount the breach, and was killed, May 6, 1527, by a ball, shot, it is said, by *Benvenuto Cellini*. He died excommunicated, without issue, in the thirty-eighth year of his age. His body being conveyed to *Gaeta*, his soldiers erected over it a splendid monument, which was afterwards destroyed.

BOURBON, Louis, Cardinal and Archbishop of Toledo, born 1777, son of the Infant Louis, brother of King Charles III. of Spain, and the Duchess of Chinchon. The marriage was concluded with the royal assent; nevertheless, it was doubted, after the death of Charles III., whether the prince would be lawful heir to the throne, if a male descendant of the old line should be wanting. He therefore entered the church, and a cardinal's hat was given to him in 1800. After the imprisonment of Ferdinand VII. at Valençay, he joined the party of the Cortes, and became very influential. He offered in 1814 the constitution of the Cortes to Ferdinand VII. for his signature; and the king having altered his determination, Bourbon lost his favour and was deprived of the archbishopric of Seville. After the events which took place on the insurrection of the army at the island of Leon, he engaged in the revolution, and was president of the provisional junta before which the king swore, at Madrid, March 9, 1820, to abide by the constitution of the Cortes of 1812. He died March 19, 1823.

BOURBON, ISLE OF (or *RÉUNION*), as it is now called in French official documents, situated in the Indian Ocean, about 400 miles E. of Madagascar; lat. 21° S.; lon. 55° 30' E. It is 45 miles long and 33 broad. It was discovered by *Mascarenhas*, a Portuguese, in 1645, who called it by his own name. The French took possession of it in 1649, and gave it the name of Bourbon. It was captured by the British in 1810, and restored to France in 1815. The pop. consists of 172,004, among whom are native Africans, Chinese, Coolies, Malays, &c. Its commerce is impeded by the want of good harbours. The principal articles of export are coffee, sugar, vanilla, gums, liohens for dyeing, cotton, hides, &c. Sugar is by far the most valuable export; vanilla comes next. The capital is *St. Denis*, a pretty town, with about 36,000 inhabitants. The heat is excessive from November to April; the evenings, however,

are refreshed by the sea-breezes, and the mornings by the land-breezes. The island is of volcanic origin, and seems to be composed of two enormous volcanic mountains, in one of which the fire is extinct; the other is still in activity. The loftiest summit, *Le Piton de Neige*, or the Snowy Spike, is about 10,000 feet above the level of the sea.

BOURBONNAIS, a province and government of old France, with the title, first of a county, and afterwards of a duchy, lying between the *Nivernais*, *Berry*, and *Burgundy*. It now forms the department of the *Allier*. It derived its name from the small town of Bourbon l'Archambault, from which the Bourbon family received their title. See *BOURBON*.

BOURBON-VEKDÉE, *NAPOLÉON-VEKDÉE*, or, since the dissolution of the Second Empire, *LA ROCHE-SUR-YON*, a town, France, capital of the department Vendée, 231 miles S.W. from Paris, agreeably situated on a hill on the right bank of the *Yon*. The streets nearly all end in a spacious square, which is bordered with ranges of fine trees, and surrounded by public monuments and elegant mansions. The parish church, with a peristyle of six Doric columns, and the *mairie* or mansion-house, an elegant Italian building, are both in the square. Besides these there are an elegant market-house, theatre, and extensive public offices, large barracks, and a small public library. There is an active trade in woollen cloth, haberdashery, and hardware. It was founded by Napoleon I. on the site of the ancient castle of Roche-sur-Yon, destroyed at the revolution, and received the name of Napoléon-Vendée, which was changed to Bourbon-Vendée at the restoration. Pop. (1891), 11,390.

BOURDALOUE, Louis, the reformer of the pulpit, and founder of genuine pulpit eloquence in France, was born at Bourges in 1632, and was sixteen years old when he entered the society of *Jesuits*. His instructors successively intrusted to him the chairs of polite letters, rhetoric, philosophy, and moral theology. In 1669 he entered the pulpit, and extended his reputation by attacking, with a powerful and religious eloquence, free from the bad taste of the age, the passions, vices, and errors of mankind. The dignity of his delivery, and the fire of his language, made him distinguished, amidst the victories of *Turenne* and the feasts of *Versailles*, among the master-spirits of the arts and of literature in the time of *Cornelle* and *Racine*. Louis XIV. invited him, at the time of Advent, in 1670, to preach before the court, and Bourdaloue acquitted himself with so much success that he afterwards received invitations at ten different times. After the repeal of the Edict of Nantes, he was sent to *Languedoc*, in order to explain to the Protestants the doctrines of the Catholic faith, and he succeeded in this difficult business in reconciling the dignity of his office with the rights of mankind. In his latter days he renounced the pulpit, and devoted himself to the care of hospitals, prisons, and religious institutions. He well knew how to accommodate his manner to the capacity of those to whom he gave instruction, advice, or consolation. With the simple, he was simple; with the learned, he was a scholar; with free-thinkers, he was a logician; and came off successful in all those contests in which the love of his neighbour, religious zeal, and the duties of his office, involved him. Beloved alike by all, he exercised authority over the minds of all; and no consideration could make him give up his openness and integrity of character. He died in 1704. His sermons have been translated into several languages.

BOURDON, SEBASTIAN, a celebrated French painter, born at Montpellier in 1616. Being poor and without occupation, he enlisted as a soldier. After

receiving his dismissal, he visited Italy, and studied under Poussin and Claude Lorraine. In 1652 he was driven from the French kingdom by the religious troubles, when he was appointed first painter to Queen Christina of Sweden. He afterwards became distinguished in his own country by many great works, among which are the following:—the Dead Christ, the Adulteress, the Old Kings of Burgundy in the Senate-house at Aix. He had no peculiar manner, but he imitated others. He was a good engraver on copper. He died in 1671, while engaged in painting the ceiling of the Tuilleries.

BOURGELAT, CLAUDE, founder of the veterinary schools, and creator of the art of veterinary surgery in France, born at Lyons in 1712; died Jan. 3, 1779. He established the first veterinary school in his native town in 1762, and by his works on the veterinary art he furnished the world with a complete course of instruction both in its theory and in its practice. They include *Éléments d'Hippiatrique*, ou *Nouveaux Principes sur la Connaissance et sur la Médecine des Chevaux* (Lyons, 1750–53), and *Traité de la Conformation Extérieure du Cheval* (1776).

BOURG-EN-BRESSE, a town of France, capital of the department of Ain, is situated 232 miles s.e. Paris, on the *Reyssouse* and the *Cône*. It is well built, and ornamented with public fountains, one of which was erected to the memory of General Joubert. On the *Promenade du Bastion* is a bronze statue of Bichat, the celebrated anatomist, who pursued his early medical studies in the hospital here. Bourg-en-Bresse has a parish church, a handsome edifice of the sixteenth century; a public library; a museum; and a spacious corn-market. Outside the town is a magnificent hospital, surrounded by gardens, and the beautiful Gothic church of Brou, built by the direction of Margaret of Austria, daughter of Maximilian I. In front of the portal stands a curious elliptical sun-dial, reconstructed by the celebrated astronomer Lalande, who was a native of this place. Bourg-en-Bresse has a lyceum, seminary, some manufactures of linen and hosiery, tanneries, a cotton-mill, &c. Pop. (1886), 16,270; (1896), 18,501.

BOURGEOIS, SIR PETER FRANCIS, painter, was born in London in 1756. At first intended for a military career, he soon determined to become an artist. In 1776 he went on a tour through France, Holland, and Italy, and three years later he exhibited his first picture. Elected A.R.A. in 1787, he became R.A. in 1793, and landscape-painter to George III. in 1794. King Stanislaus of Poland in 1791 appointed him his painter and conferred on him the honour of knighthood, and shortly afterwards George III. also knighted him. He died on Jan. 8th, 1811, having bequeathed many pictures and a considerable sum of money to Dulwich College.

BOURGEOISIE, a name applied in France to citizens of towns who did not belong to the nobility or clergy, and in a narrower sense to townpeople occupying an independent position—merchants, tradesmen, independent artisans, lawyers, &c. In the early period of the middle ages this class was much oppressed, and as a consequence of that it was poor and possessed little culture and refinement. In subsequent centuries it succeeded in raising itself in all these respects, and latterly it attained a position of political equality with the nobility and clergy, and came to be spoken of as the 'third estate' (*tiers état*). The word is now used in a somewhat vaguer sense than formerly, and may be taken to correspond pretty much with our equally vague appellation the 'middle classes'.

BOURGES, an ancient city of France, capital of the department of Cher, situated at the confluence of the Auron and Yèvre, 124 miles s. of Paris. It is

surrounded with ramparts, now laid out as promenades, and has crooked but spacious streets, and many houses built in the old style. The most noteworthy buildings are: the cathedral, erected in the thirteenth century, and esteemed one of the finest Gothic structures in France; the churches of *Nôtre Dame* and *St. Bonnet*; the archiepiscopal palace; the *Palais de Justice*, an interesting old building otherwise the house of Jacques Cœur (silver-smith of Charles VII.); and the *Hôtel l'Allemand*, a chef-d'œuvre of the Renaissance. Bourges has a lyceum, a normal school, a public library, a museum, a general hospital, &c. It is an important military centre, and has a cannon foundry, arsenal, &c. It has manufactures of leather, cloth, cutlery, &c. In the time of Julius Cæsar, who took the town in B.C. 52, Bourges was called *Avaricum*. In the middle ages it was capital of the province of Berry. The great fire of 1487, which destroyed 3000 houses, gave its prosperity a blow which it never recovered. Pop. (1896), 43,587.

BOURGOGNE. See **BURGUNDY**.

BOURMONT, LOUIS AUGUSTE VICTOR, COMTE DE **GHAISNE DE**, Marshal of France, born September 2, 1778, at the castle of Bourmont in Anjou; died there October 27, 1846. At an early age he took part in the campaign in La Vendée, at a later period entered the Republican army, and was advanced by Napoleon, under whom he had distinguished himself at Dresden and Nogent, to the rank of general of division. Although he had gone over to the Bourbons in March, 1814, Napoleon, on his return from Elba, gave him a command, which, however, Bourmont resigned before the battle of Ligny, in order to go over to the side of the allies. Some years after, as commander of the army of intervention in Spain, he obtained some brilliant successes. His greatest success was the conquest of Algiers, which procured him a marshal's staff in 1830. After the revolution of July, 1830, he followed the banished dynasty into exile. In 1833 Dom Miguel, king of Portugal, placed him at the head of his troops which were to act against the adherents of Dom Pedro; but he was unsuccessful. He afterwards sought to act in the interest of the Carlists in Spain, and when he at last returned to his native country he found that he had almost entirely lost his popularity, and accordingly retired for the rest of his life to his estate in Anjou.

BOURN, a town of England, in Lincolnshire, 33 miles s. of Lincoln. The town lies at the foot of a range of hills, and consists of four principal streets, meeting in the market-place. The houses are generally of brick, for the most part irregularly but well built, and the place is amply supplied with water. The Church of SS. Peter and Paul is a large ancient structure, formerly with two west towers. The Old Red House is an Elizabethan structure formerly owned by Sir Everard Digby, who was executed for his share in the Gunpowder Plot. It is now used as a railway-station. Pop. (1891), 4191; (1901), 4362.

BOURNE, VINCENT, an English scholar, distinguished for the beauty of his Latin poems, was born in 1695, and died December 2, 1747. In 1710 he became a king's scholar in Westminster School, from which he proceeded to Trinity College, Cambridge, in 1714. Here he graduated as B.A. in 1717, and as M.A. in 1721. On leaving Cambridge, where he was successful in obtaining a fellowship, he became a master in Westminster School, in which position he remained to the end of his life. The poet Cowper was one of his pupils, and turned some of his poems into English verse. The poems of Vincent Bourne consist of a considerable number of original Latin elegiacs, and of some translations of short English poems into Latin, which are as remarkable for

their fidelity to the original as for the correctness and beauty of the Latin into which they are rendered. He is also the author of a few epitaphs in Latin and English. An edition of his works with the title *Pœmata* was published 1784.

BOURNEMOUTH, a famous watering-place in the south of England, on the English Channel, at the south-west corner of Hampshire, near the boundary of Dorsetshire, within the limits of the parliamentary borough of Christchurch, but forming a mun. and co. bor. by itself. It is situated on a semicircular bay at the mouth of a small stream, the Bourne, from which it derives its name. It is celebrated as a winter residence, and has of late become very popular as a sea-side resort for consumptive and other delicate persons, owing to the mildness of its climate while its many attractive features, including its fine sands, its interesting cliff and other scenery, and its pine-woods, bring to it numbers whose health is no way defective. It is to a large extent laid out in villas and detached houses. The Westover Gardens in the centre of the town are a favourite resort; they include a winter garden, where orchestral concerts are regularly given. There are two piers, three arcades, &c. The buildings include hospitals, a sanatorium, home for consumptives, and some handsome churches, among the latter being the new Bennett Memorial Church and St. Peter's Church, both beautiful Gothic buildings. In the churchyard of the latter lie buried William Godwin, Mary Wollstonecraft, and their daughter, the wife of Shelley. Pop. in 1881, 16,858; in 1891, 37,650; in 1901, 47,003.

BOURNOUSE. See **BURNOUSE**.

BOURRIENNE, FAUVELET DE, a French historian and diplomatist, was born at Sens on 9th July, 1769, and educated along with Bonaparte at the school of Brienne, where a close intimacy sprang up between them. On their separation in 1785, when Bonaparte set out to attend the École Militaire in Paris, they vowed an eternal friendship. At the age of nineteen he proceeded to one of the German universities, with the view of studying law and languages. He returned to Paris in 1792, and renewed his early friendship with Bonaparte, who employed him in drawing up, along with General Clarke, the text of the Treaty of Campo Formio. From this period Bourrienne's diplomatic career commenced. He accompanied Bonaparte as his private secretary on his expedition to Egypt, and afterwards continued in that capacity on his elevation to the consulate. In 1804 he was nominated by the emperor his minister plenipotentiary at Hamburg. In the end of 1813 he returned to France, where he received the appointment of director of the posts, and in 1814 was made prefect of police. On the abdication of Napoleon he paid his court to Louis XVIII., who, on his restoration, nominated him a minister of state. The revolution of July, 1830, and the loss of his private fortune affected him so much that he lost his reason. He was removed to Normandy, and spent the last two years of his life in a lunatic asylum at Caen, where he died of a fit of apoplexy on February 7, 1834. His *Mémoires sur Napoléon, le Directoire, le Consulat, l'Empire et la Restauration*, edited by Villemarest, appeared in the years 1829-31 in ten volumes. They contain many interesting particulars of the youth of Napoleon, and also of the history of the directory and consulate, although they are blamed for want of accuracy in many points of detail.

BOURSAULT, ENNE, a French writer, born in 1638. Having gone to Paris and engaged in literature he both gained and lost the favour of royalty, and produced pieces for the stage with permanent success; among others, *Esope à la Ville*, and *Esope à la Cour*, which still continue on the stage. His two

tragedies *Marie Stuart* and *Germanicus* are forgotten. Boursault had the misfortune to quarrel with Molière and Boileau. He wrote a severe criticism on the *École des Femmes*, under the title of *Le Portrait du Peintre*. Molière chastised him in his *Impromptu de Versailles*. To revenge himself on Boileau, who had ridiculed him in his satires, he wrote a comedy called *Satyre des Satyres*; but Boileau prevented its performance. Boursault afterwards took a noble revenge. He heard that Boileau was at the baths of Bourbonne entirely destitute; he hastened to him and compelled him to accept a loan of 200 louis d'or. Touched by this generous conduct, Boileau struck his name from his satires. Boursault died at Montluçon in 1701.

BOUSSA, a town of Africa, in the Soudan, capital of the native state of Borgu, on an island in the Niger or Quorra, about 3 miles long and 1 mile broad; lat. 10° 14' N.; lon. 4° 11' E. It is walled, and being surrounded by rocks is a place of considerable strength. The houses are irregularly placed, and thus cover a space of ground disproportioned to the number of inhabitants. The soil of the country is fertile, producing corn, yams, cotton, rice, and timber trees in great abundance. Among the wild animals are elephants, hippopotami, lions, &c. Boussa has obtained a melancholy notoriety from the circumstance of its being the place where the enterprising traveller Park met his death in 1805. The pop. of Boussa (which is now within British protected territory) has been estimated at 12,000 to 18,000.

BOUSTROPHEDON, a kind of writing which is found on Greek coins, and in inscriptions of the remotest antiquity. The lines do not run in a uniform direction from the left to the right, or from the right to the left; but the first begins at the left and terminates at the right; the second runs in an opposite direction, from the right to the left; the third, again, from the left; and so on alternately. It is called *boustrophedon* (that is, *turning back like an ox*) because the lines written in this way succeed each other like furrows in a ploughed field. The laws of Solon were cut in tables in this manner.

BOUTERWEK, FRIEDRICH, professor of moral philosophy at Göttingen, a man of much merit as an academical instructor and a writer on literature, was born April 15, 1768, at Oker, a village not far from Goslar, in North Germany. After applying himself to many departments of learning, jurisprudence, poetry, &c., he at last became entirely devoted to philosophy and literary history. He was at first a follower of Kant, but finally attached himself to Jacobi. His *Ideen zu einer allgemeinen Apodiktik* was the immediate fruit of his intimate acquaintance with the philosophical views of Fr. H. Jacobi. This work was published in two volumes, 1799. It was afterwards completed by the *Manual of Philosophical Knowledge* (two vols. 1813; 2d edition, 1820), and by the *Religion of Reason* (Göttingen, 1824). In this work, as well as in his *Aesthetik* (two vols. 1806 and 1824), he had to contend with many powerful antagonists. Bouterwek has gained a permanent reputation by his *Geschichte der neuern Poesie und Beredsamkeit* (History of Modern Poetry and Eloquence) published in 1801-19, a work which, though unequal in some respects, and in parts, especially in the first volume, partial and superficial, is an excellent collection of notices and original observations, and may be considered one of the best works of the kind in German literature. Among his minor productions, a selection of which he published in 1813, are many essays, which are superior to the best of his larger speculative works; for instance, the introduction to the History, in which he gives an account of his literary labours until that period, with great candour and with almost excessive severity against himself.

Bouterwek died in 1828. His History of Spanish Literature has been translated into Spanish, French, and English.

BOUITS RIMÉS (French), words or syllables which rhyme, arranged in a particular order, and given to a poet with a subject, on which he must write verses ending in the same rhymes, disposed in the same order. Ménage gives the following account of the origin of this ridiculous conceit, which may be classed with the eggs and axes, the echoes, acrostics, and other equally ingenious devices of learned triflers. 'Dulot (a poet of the seventeenth century) was one day complaining, in a large company, that 300 sonnets had been stolen from him. One of the company expressing his astonishment at the number, "Oh," said he, "they are blank sonnets, or rhymes (*bouits rimés*) of all the sonnets I may have occasion to write." This ludicrous statement produced such an effect that it became a fashionable amusement to compose blank sonnets, and in 1648 a 4to volume of *bouits rimés* was published.' Sarrazin's Dulot Valenc, on la Défaite des Bouits Rimés, is an amusing performance.

BOVINO (anciently *Bovinum*), a town, Italy, Naples, province of Foggia, 20 miles s.w. Foggia, near the Cervaro; the seat of a bishopric, suffragan to Benevento. It is fortified, and has a cathedral, two parish churches, and several convents. The Spaniards were defeated here by the Imperialists in 1784. Pop. 8721.

BOW, the name of one of the most ancient and universal weapons of offence. It is made of steel, wood, horn, or other elastic substance, which, after being bent by means of a string fastened to its two ends, in returning to its natural state, throws out an arrow with great force. The figure of the bow is nearly the same in all countries, having generally two inflexions, between which, in the place where the arrow is fixed, is a right line. The Grecian bow was somewhat in the form of the letter Z: in drawing it, the hand was brought back to the right breast, and not to the ear. The Scythian bow was distinguished for its remarkable curvature, which was nearly semicircular; that of the modern Tartars is similar to it. The materials of bows have been different in different countries. The Persians and Indians made them of reeds. The Lycian bows were made of the cornel-tree, those of the Ethiopians, of the palm-tree. That of Pandarus (Il iv. 104) was made from the horn of a mountain goat, 16 palms in length the string was an oxhide thong. The horn of the antelope is still used for the same purpose in the East. The long-bow was the favourite national weapon in England. The battles of Crecy (1346), Poitiers (1356), and Agincourt (1415) were won by this weapon. It was made of yew, ash, &c., of the height of the archer. The arrow being usually half the length of the bow, the cloth-yard was only employed by a man 6 feet high. The arbalest, or cross-bow, was a popular weapon with the Italians, and was introduced into England in the thirteenth century. The arrows shot from it were called *guarrels*. The *bolé* was used with both kinds of bows.

Of the power of the bow, and the distance to which it will carry, some remarkable anecdotes are related. Xenophon mentions an Arcadian whose head was shot through by a (Carchudian archer. Stuart (Ath. Ant. i) mentions a random shot of a Turk, which he found to be 584 yards; and Mr. Strutt saw the Turkish ambassador shoot 480 yards in the archery ground near Bedford Square. Lord Bacon speaks of a Turkish bow which has been known to pierce a steel target or a piece of brass 2 inches thick. In the journal of King Edward VI. it is mentioned that 100 archers of the king's guard shot at a 1-inch board, and that some of the arrows passed through this and into an-

other board behind it, although the wood was extremely solid and firm. It has been the custom of many savage nations to poison their arrows. This practice is mentioned by Homer and the ancient historians; and we have many similar accounts of modern travellers and navigators from almost every part of the world. Some of these stories are of doubtful authority, but others are well authenticated. Some poison obtained by Condamine from South American savages produced instantaneous death in animals inoculated with it. The poisoned arrows used in Guleas are not shot from a bow, but blown through a tube. They are made of the hard substance of the cokerite tree, and are about 1 foot long, and of the size of a knitting-needle. One end is sharply pointed, and dipped in the poison of woorai; the other is adjusted to the cavity of the reed from which it is to be blown, by a roll of cotton. The reed is several feet in length. A single breath carries the arrow 30 or 40 yards. The blow-tube is used also in Borneo. See **ARCHERY**.

BOW, in music, is the name of that well-known instrument by the means of which the tone is produced from viola, violin, and other instruments of that kind. It is made of a thin staff of elastic wood, tapering slightly till it reaches the lower end, to which the hairs (about 80 or 100 horse-hairs) are fastened, and with which the bow is strung. At the upper end is an ornamented piece of wood or ivory called the *nut*, and fastened with a screw, which serves to regulate the tension of the hairs. It is evident that the size and construction of the bow must correspond with the size of the species of viol-instruments from which the tone is to be produced.

BOWDICH, THOMAS EDWARD, an ingenious and enterprising man; one of the victims of the attempts to explore the interior of the African continent. He was born at Bristol in June, 1790, and was sent to Oxford, but was never regularly matriculated. At an early age he married, and engaged in trade at Bristol. Finding the details of business irksome, he obtained the appointment of writer in the service of the African Company, and set sail for Africa in 1814. In 1816, it being thought desirable to send an embassy to the Negro King of Ashantee, Bowdich was chosen to conduct it; and he executed with success the duties of his situation. After remaining some time in Africa he returned home, and soon after published his *Mission to Ashantee*, with a Statistical Account of that Kingdom, and Geographical Notices of other Parts of the Interior of Africa (1819, 4to). Having offended the company in whose service he had been engaged, and having, therefore, no prospect of farther employment, yet wishing ardently to return to Africa for the purpose of visiting its hitherto unexplored regions, Bowdich resolved to make the attempt with such assistance as he could obtain from private individuals. He, however, previously went to Paris to improve his acquaintance with physical and mathematical sciences. His reception from the French literati was extremely flattering. A public eulogium was pronounced on him at a meeting of the Institute, and an advantageous appointment was offered him by the French government. To obtain funds for the prosecution of his favourite project, Bowdich also published a translation of Mollien's *Travels to the Sources of the Senegal and Gambia*, and other works; by the sale of which he was enabled, with a little assistance from other persons, to make preparations for his second African expedition. He sailed from Havre in August, 1822, and arrived in safety in the river Gambia. A disease, occasioned by fatigue and anxiety of mind, here put an end to his life, January 10, 1824.

BOWDOIN, JAMES, a governor of Massachusetts, was born in the year 1727, at Boston. New England

In 1758 he was elected a representative to the general court, and in 1756 became a member of the council. In this situation he continued until 1769, when he was negatived by Governor Bernard on account of his decided Whig principles, but afterwards accepted by Hutchinson because he thought his influence more prejudicial 'in the house of representatives than at the council board.' In consequence of his being a member of the committee who prepared the answer to the governor's speeches, which asserted the right of Great Britain to tax the colonies, he was negatived by Governor Gage in the year 1774. In 1785 he was appointed governor of Massachusetts, and had the good fortune to crush, without a single execution, an insurrectionary movement against the government. Governor Bowdoin was a member of the convention of Massachusetts assembled to deliberate on the adoption of the constitution of the United States, and exerted himself in its favour. He was ever an ardent lover of learning and science, and a benefactor to others of the same character. The University of Edinburgh honoured him with the degree of LL.D., and the Royal Societies of Dublin and London, with several other foreign societies, admitted him among their members. His letters to Dr. Franklin have been published. He died at Boston, 1780.

BOWER. See **ANCHOR.**

BOWER, ARCHIBALD, a Scottish writer, born near Dundee in 1686, of Roman Catholic parents, entered the order of Jesuits in 1706. At Macerata, in Italy, according to his own account, he was counsellor or judge of the Inquisition. In 1728 he quitted the order of Jesuits and went to Perugia, whence he fled secretly to England, and professed himself a convert to the Protestant faith. He obtained respectable patronage, was engaged as a tutor in a nobleman's family, and employed by the booksellers in conducting the *Historia Literaria*, a monthly review of books, and in writing a part of the *Universal History*, in sixty vols 8vo. The money which he gained by these occupations he is believed to have given or lent to the society of the Jesuits, and thus to have purchased his re-admission among them about the year 1744. Subsequently repenting of the engagement he had made with his old associates, he claimed and recovered the property he had advanced. In 1748 he published the first volume of a *History of the Popes*, which was continued to seven volumes, and characterized by the utmost zeal against Popery. His money transactions with the Jesuits being at last brought to light, he was generally believed to be a man destitute of moral or religious principle; so that towards the end of his life he had hardly a friend or patron left except Lord Lyttelton. He died a Protestant in 1768.

BOWER-BIRD, a name given to certain Australian birds belonging to the family of the Sturnidae, which have received their common name from a remarkable habit they have of building bowers, in which they congregate at certain seasons. They attracted a considerable amount of attention through the account of them given by Mr. Gould, and through the fact that a pair of one species of these birds have been brought alive to London, where they now form one of the attractions of the Zoological Gardens. This species is the *Satin Finches-bird* (*Ptilonorhynchus holosericeus*), so-called on account of its beautiful glossy plumage. The male is really a splendid bird. The feathers of the body are of a deep bluish-black colour; the wing-feathers are quite black, except at the tips, where they are blue; the iris is bright blue, with the exception of a narrow red ring next to the pupil; the bill is light-blue; yellow at the tip; and the foot is reddish. The bird is a native of New

South Wales, and its favourite resort is the luxuriant and densely-wooded regions of that part of Australia. The bowers above-mentioned are commonly constructed under the protection of overhanging branches of trees in the most retired parts of the forest, and always on the ground. At each end there is an entrance left open. They are commonly adorned with all sorts of bright-coloured objects, such as the variegated tail-feathers of different kinds of parrots, mussel-shells, small pebbles, bones, &c. The feathers are stuck in between the twigs with which the bowers are built, and the other ornaments are laid out at the entrance. These bowers do not serve as nests at all. They rather seem to be places of amusement for both the male and female birds, which are seen sportively running out and in the bowers in pursuit of one another. Apparently they are used as a sort of rendezvous during the pairing and breeding season.—Another species, the *Chlamydera naevulata*, is nearly allied to the satin bower-bird. It is about 11 inches in length; the general colour of the plumage is brown, but the under side is grayish-white. Its neck is adorned by a collar of elongated feathers of a light rose-pink, which form a sort of fan. This species is confined to the interior of Australia. It is very shy, and is therefore seldom seen by travellers. Its bowers are constructed with even more art than those of the satin bower-bird, and are more profusely adorned.

BOWIE-KNIFE, a long kind of knife like a dagger, but with only one edge, named after Colonel James Bowie. It was originally a weapon confined to Texas, but is now used in almost all the states of the Union. Bowie is said to have had his sword broken down to within about 20 inches of the hilt in a fight with some Mexicans, but he found that he did such good execution with his broken blade, that he equipped all his followers with a similar weapon.

BOW INSTRUMENTS are all the instruments strung with cat-gut, from which the tones are produced by means of the bow. The most usual are the double bass (*violone* or *contrabasso*); the bass violin, or *violoncello*; the tenor violin (*viola*); and the violin proper (*violino*). In reference to their construction, they are all alike: the difference is in the size. See **VIOLIN** and **QUARTETT**.

BOWLES, WILLIAM LISLE, an English poet of some note, was born on 24th September, 1762, at King's Sutton, on the borders of Northamptonshire, where his father was vicar. When he was seven years old the family removed to Upphill, Somersetshire, owing to his father having been presented to the living of that parish. At the age of fourteen he was sent to Winchester School, under the mastership of Dr. Joseph Warton. In 1782 he proceeded to Trinity College, Oxford, where he gained high honours, and remained till 1787. A disappointment in love led, about this time, to his undertaking a journey through Great Britain and to the Continent, and on this tour he composed, for his amusement, a series of sonnets, which he afterwards published in 1789, under the title of *Fourteen Sonnets written chiefly on Picturesque Spots during a Journey*. The success of these was extraordinary, and they may be said to have inaugurated a new school of poetry, the excellences of which were afterwards fully developed by Wordsworth and Coleridge. The freshness and originality of the sonnets attracted Coleridge—then a pupil at Christ's Hospital—so powerfully that, as he informs us, he wrote out in his own hand, within eighteen months, no fewer than forty copies as presents for his friends. In 1792 Bowles entered holy orders; and after two successive appointments in the county of Wilts, was presented to a living in Gloucestershire. In 1797 he married a daughter of Dr. Wake, prebendary of Westminster, was made a

prebend of the cathedral of Salisbury in 1804, and in the same year was presented by Archbishop Moore to the living of Bremhill, in Wiltshire, where he continued to reside almost continuously during the remainder of his life. In 1804 also he published the *Spirit of Discovery*, a poem in blank verse, in six books; and in 1809 appeared his edition of Pope's works, in ten volumes. To this last he appended an essay on *The Poetical Character of Pope*, which, from the comparatively depreciative estimate which he expressed as to the quality of his poetry, and also from the attacks on Pope's moral character, drew down on him the satirical lash of Lord Byron in his *English Bards and Scotch Reviewers*, and at a later period called forth from Campbell in 1819, in his *Specimens of the English Poets*, an elaborate attack on the critical soundness of the principles advanced in the essay. In 1815 Bowles published his *Missionary of the Andes*, a poem in six books, which is perhaps the best of his works. His subsequent poetical writings were *The Grave of the Last Saxon*, a legend of the battle of Hastings, in six books, published in 1822; *Days Departed*, or *Banwell Hill*, a descriptive poem in blank verse, published in 1828; *St. John in Patmos*, a poem in blank verse, published anonymously in 1833; *Scenes and Shadows of Days Departed*, a series of poems; and the *Village Verse-book*, a collection of hymns, both published in 1837. He died at Salisbury on 7th April, 1850, in his eighty-eighth year.

BOWLINE, in ships, a rope leading forward, which is fastened by bridles to loops in the ropes on the perpendicular edge of the square sails. It is used to keep the weather-edge of the sail tight forward and steady when the ship is close hauled to the wind. Hence a ship is said to sail on a bowline, or to stand on a taut bowline.

BOWLS, BOWLING, an ancient English game, still extremely popular. It is played on a smooth, level piece of green sward, generally about 40 yards long, and surrounded by a trench or ditch about 6 inches in depth. A small white ball, usually of earthenware, called the *jack*, is placed at one end of the green, and the object of the players, who range themselves in sides at the other, is so to roll their bowls that they may lie as near as possible to the jack. Each bowl is much larger than the jack, is made of lignum-vitæ or other similar wood, and is *biased* by being made slightly conical, so as to take a curvilinear direction; and in making the proper allowance for this bias, and so regulating the cast of the ball, consist the skill and attraction of the game. The side which owns the greatest number of bowls next the jack, each bowl so placed constituting a point, carries off the victory. The game played in Scotland differs in several respects from that of England; and the latter country, unlike the former, has as yet no national bowling association. Another description of bowling forms a favourite game in America, and has been introduced into Great Britain. It is played generally indoors, in a covered alley of carpenter's work, from 50 to 65 feet in length and about 4 feet in width. The alley has a gutter, so called, on each side, and is slightly convex in the centre, and regularly bevelled to the sides. At the farther extremity ten pins, generally of ashwood, of about 1 foot in height, are set up in the form of a pyramid. The players roll wooden balls at these, and endeavour to knock down as many as possible at each throw. The pins, when set up, are termed a *frame*, and at each frame the bowler rolls three balls. The number of pins knocked down is registered, and the frame set up again for the next player.

BOWRING, Sir JOHN, a distinguished English statesman and linguist, was born at Exeter, October

17, 1792. While still very young he entered a business house in his native town, and in 1811 became clerk to a London firm, on whose business he travelled to Spain. Soon afterwards he started on his own account, and made many journeys to the Continent. Having an extraordinary linguistic faculty, he made use of his residence in foreign countries to acquire the different languages, and his first publications consisted of translations, especially of the popular poetry of many of the countries he had visited. At the same time he appeared as a supporter of the Radical politics of the time, and of the views of Jeremy Bentham, and acted as editor of the *Westminster Review* from 1824 till 1830. His public life began in 1828, when he was sent to Holland to make a report on the public accounts of that kingdom. He afterwards received similar commissions to France, Switzerland, Italy, Egypt, Syria, and Germany, and the Blue-books which appeared from his pen on these separate occasions are considered as models of their kind. He was member of Parliament for the Kilmarnock Burghs from 1835 to 1837, and for Bolton from 1841 to 1849. In the year last mentioned he accepted the lucrative post of consul at Canton, and his services during the four years that he held this post were so appreciated by the ministry that in 1854, the year after his return, he received the honour of knighthood, and was appointed governor of Hong kong. As governor of Hong-kong he acted with the same energy that he had manifested when consul at Canton; but the step which he took in ordering Canton to be bombarded to punish the Chinese for an insult offered to the British flag, although approved by Lord Palmerston, then at the head of the government, led to his recall, March, 1857. The last public commission he received was in 1860, when he was sent to Italy to report on the commercial relations with the new kingdom. He died at his residence, Claremont, near Exeter, Nov. 23, 1872.

BOWSPRIT, a large spar projecting from the stem-head of a ship, and carrying at its end another spar known as the jib-boom. To these are fixed the fore-mast stays. In some kinds of sailing vessel a running bowsprit is used. See **SHIP**.

BOW-WINDOW, in architecture, properly a window forming a recess or bay in a room, projecting outwards, and having for the outline of the plan a segment of a circle. This term is, however, often confounded with *bay-window* and *oriel*, which properly designate, the first a similar window with a straight-sided plan, and the second a projecting window not on the ground floor, and supported on a corbel or other moulded base.

BOWYER, WILLIAM, English printer and classical scholar, was born on Dec. 19th, 1699, at London, where his father, also a printer, carried on business. The son acquired the rudiments of learning under Ambrose Bonwicke, a nonjuring clergyman, and was afterwards admitted a sizar of St. John's College, Cambridge, but left the university without a degree in 1722, and became an associate in trade with his father. In 1729 he obtained the office of printer of the votes of the House of Commons, which he held nearly fifty years. He was subsequently appointed printer to the Society for the Encouragement of Learning, the Society of Antiquarians, of which learned body he was admitted a member; and in 1761 Lord Macclesfield procured him the appointment of printer to the Royal Society. In 1767 he was nominated printer of the journals of the House of Lords, and the rolls of the House of Commons. He died on Nov. 18th, 1777, aged seventy-eight, and was interred in the church of Low Layton, in Essex. By his will he bequeathed a considerable sum of money, in trust to the Stationers' Company, for the

relief of decayed printers or compositors. His principal literary production was an edition of the New Testament in Greek (1763), with critical notes and emendations. He also published several philological tracts, and added notes and observations to some of the learned works which issued from his press. About ten years previous to his decease he entered into partnership with Mr. John Nichols, who shortly after that event published a small volume of biographical anecdotes of Bowyer and his learned contemporaries, which formed the basis of his *Literary Anecdotes of the Eighteenth Century*, nine volumes 8vo—a work containing a vast mass of undigested materials for a history of English literature during the period to which it relates.

BOXING, or PUGILISM, a manner of fighting with the fists so common in England as to be regarded abroad as a national characteristic. The art of boxing consists in showing skill in dealing blows with the fist against one's opponent, especially on the upper part of the body, while at the same time one protects one's self. The art is carried on according to certain rules, which are universally observed—for example, that as long as one of the combatants is lying on the ground he may not be struck by the other. The one who first intimates his desire that the combat should cease, or who is unable to rise again within a given time after being knocked down, is considered to be beaten. In England professional boxers, who made a livelihood out of their skill in the art, were at one time common, especially during the reigns of the Georges. At the beginning of the nineteenth century, and even much later, persons of the highest rank were sometimes to be seen at pugilistic combats, and 'professors' of the art frequently had members of the nobility among their pupils. Byron relates in his diary that he received instruction in boxing from the celebrated Jackson, who made a fortune as a pugilist. Boxing has, however, now fallen in a great measure into disrepute, and the matches are constantly put a stop to by the police, though the practice of boxing is not even yet deprived of all defenders. Prize-fights are illegal in England and the United States, and both the principals and the spectators may be proceeded against; but boxing with gloves is still fairly common. In ancient times boxing was practised in the Greek games and in the Roman gladiatorial spectacles. Among both Greeks and Romans the fist was armed with a kind of glove called *cestus*, made of leather thongs, and sometimes loaded with iron or lead. It is not to be wondered at that these fights were often fatal. The Amateur Boxing Association now divides boxers into five classes, according to weight. These are: *bantam weight*, not exceeding 8 stone 4 lb; *feather weight*, not over 9 stone; *light weight*, not over 10 stone; *middle weight*, not over 11 stone 4 lb.; and *heavy weight*, including all weights. See *Boxiana*, or Sketches of Ancient and Modern Pugilism, by Pierce Egan (4 vols. London, 1818-1824); Michell's *Boxing* (Hadminton Library, 1889); and Earl's *Hand-book of Boxing* (1893).

BOXING-DAY, the day after Christmas, which was made a bank-holiday in England by the act of 1871, and which has long been held almost universally as a holiday in the southern portion of Britain. It is so called from the practice of giving Christmas boxes as presents on that day.

BOX-TREE (*Buxus sempervirens*), a shrub or tree of the natural order Euphorbiaceae. It has small evergreen, ovate-elliptic, entire, shining, opposite leaves, and produces bunches of inconspicuous flowers in the axils of the leaves. These flowers are unisexual, but males and females are found on the same plant. The box is a native of Europe, Western Asia, and North Africa; though growing wild in many parts

of Britain, it is regarded as not indigenous, except in some parts of the south of England. Its wood is very heavy, hard, close-grained, light-yellow in colour, susceptible of a fine polish, and not liable to destruction by insects. These qualities cause it to be extensively employed in wood-engraving, turning, the manufacture of mathematical and various musical instruments, &c. The best wood for these purposes is imported from Caucasus. In Britain and other countries the box is very generally planted as an ornamental tree, and a dwarf variety is a common garden edging. The Minorca Box (*B. balearica*) of the Mediterranean region is a larger species, also occasionally planted in shrubberies. It often attains a height of 60 or 80 feet, and its leaves, which are paler than those of the common box, are about 3 inches in length, and of elliptical form.

BOYACA, the most populous department of Colombia, South America, lying on the Venezuelan border to the s.e. of Santander. Mountainous in the w., and consisting of great plains in the e., it produces emeralds, copper, iron, salt, and various cereals. Horses and cattle are reared on the plains. Area, 33,351 square miles; pop. about 720,000. The capital is Tunja.

BOYCE, WILLIAM, an eminent musical composer, born in London in 1710, was a pupil of Dr. Maurice Greene, organist of St. Paul's, who at his death bequeathed him a valuable collection of church music, which served as the basis of a splendid publication of that class by Boyce in three vols. folio. Notwithstanding that he was afflicted with deafness, which increased to such a degree as to render him almost insensible of sound, he acquired an uncommon degree of skill in his profession. In 1736 he was chosen organist to the church of St. Michael, Cornhill; and was also appointed composer, and afterwards (in 1758) organist to the Chapel Royal. On his setting to music an ode performed at the installation of his patron the Duke of Newcastle as chancellor of Cambridge University in 1749, he was honoured with the degree of Doctor of Music; and in 1755 he became master of the king's band. He died of the gout in 1779, and was interred in St. Paul's Cathedral. His greatest work is the scholarly Cathedral Music (3 vols. 1760-78), but he will be most generally remembered as the composer of *Hearts of Oak*, which first occurred in Garrick's pantomime of *Harlequin's Invasion* (1759). Of his musical compositions a serenata entitled *Solomon*, published in 1743, is the best.

BOYCOTTING, a name given to an organized system of social and commercial exclusion employed in Ireland in connection with the Land League and the land agitation of 1880, and subsequently. Landlords, tenants, or other persons who are subjected to boycotting find it difficult or impossible to get anyone to work for them, to supply them with the necessities of life, or to associate with them in any way. It took its name from Captain James Boycott, a Mayo landlord, one of its earliest victims. The term is also employed to any similar system of exclusive dealing.

BOYD, MARK ALEXANDER, a Scottish literary character of some little note, born in 1663. He was educated at Glasgow under the superintendence of his uncle, the archbishop of that see, and was equally conspicuous for the quickness of his parts and the turbulence of his disposition. Quitting study, he went to Paris, where he reduced himself to distress by gaming, and then resuming his studies with scholastic ardour, repaired to Bourges to attend the celebrated civilian Cujacius. To this professor he recommended himself by a compliance with his taste in Latin poetry, which gave a preference to Ennius

and the elder Latin poets. After leading a wandering life on the Continent for fourteen years, he returned to Scotland, and died at his father's seat in Ayrshire in 1601. He has received much the same eulogium in regard to graces of person, powers of mind, and various accomplishments, as the Admirable Crichton. He left various MSS. on subjects political, critical, and patriotic, but is popularly known only by his *Epistole Heroidum*, and his *Hymni*, published in the *Delicite Poetarum Scotorum*. They exhibit some tolerable imitations of Ovid, but otherwise display more learning than poetry.

BOYD, ROBERT, of Trochrig, an eminent divine of the seventeenth century, was born at Glasgow in 1578. He studied philosophy and divinity at the University of Edinburgh, and afterwards went to France, where he taught various departments of literature in the schools of Tours and Montauban. In 1604 he was ordained pastor of the church at Verteuil, and in 1606 he was appointed one of the professors in the University of Saumur. King James having heard of his worth and talents, offered him the principality of the University of Glasgow, which he accepted. He afterwards became principal of the University of Edinburgh, and one of the ministers of that city. His last appointment was to Paisley. He died on the 5th of January, 1627, in the forty-ninth year of his age. Of his works, few of which are printed, the largest and best known is his *Prælectiones in Epistolam ad Ephesios*, printed in 1652, folio. An elaborate life of him is to be found among the *Wodrow MSS.*

BOYD, ZACHARY, a Scottish divine of the seventeenth century, was born before the year 1590, and was descended from the family of the Boyds of Pinkell in Carrick (Ayrshire). He was cousin to Robert Boyd of Trochrig. He received the rudiments of his education at the school of Kilmarnock, and passed through an academical course in the College of Glasgow. About the year 1607 he had finished his studies in his native country. He then went abroad, and studied at the College of Saumur in France under his relation, Robert Boyd. He was appointed a regent in this university in 1611, and is said to have been offered the principality, which he declined. According to his own statement he spent sixteen years in France, during four of which he was a preacher of the gospel. In consequence of the persecution of the Protestants, he was obliged in 1621 to return to his native country. On his reaching Scotland he lived successively under the protection of Sir William Scott of Ellie and of the Marquis of Hamilton and his lady at Kinnell, it being then the fashion for pious persons of quality in Scotland to retain one clergyman at least as a member of their household. In 1623 he was appointed minister of the large district in the suburbs of Glasgow styled the Barony parish, for which the crypts beneath the cathedral church then served as a place of worship. In this charge he continued all the remainder of his life. In the years 1634-35 and 1645 he filled the office of rector of the University of Glasgow, an office which appears from its constituency to have then been very honourable. In 1629 he published his principal prose work, *The Last Battell of the Soule in Death*; whereby are shown the diverse Skirmishes that are between the Soule of Man on his Deathbed and the Enemies of our Salvation, carefully digested for the Comfort of the Sick. This was reprinted at Glasgow in 1831, with a life of the author, by Mr. Neil. Besides this, he published various other works, chiefly devotional, and left a large quantity of MSS. writings, which are preserved in the Glasgow College library. Among the latter is one entitled *Zion's Flowers*, which consists of poems on select subjects

of Scripture history. This work is popularly called *Zachary Boyd's Bible*, and many absurd stories are told of its contents. But although it abounds in homely and ludicrous passages, it is not without a fine strain of devotional feeling, and it owes much of its character to the spirit of the age in which it was written. Mr. Boyd died in 1653 or 1654, leaving a large legacy to the Glasgow College.

BOYDELL, JOHN, an English engraver, but more distinguished as an encourager of the fine arts than on account of his own productions. He was born in Staffordshire in 1719, and was intended for his father's occupation, which was that of a land-surveyor. Accident having thrown in his way *Baddesley's Views of different Country Seats*, he conceived so strong an inclination for engraving that he determined to adopt it as a profession; and accordingly, when above twenty, he bound himself apprentice for seven years to *Toms*, a London engraver. In 1745 he published six small landscapes, and afterwards executed as many more views of places in and near London as formed a volume, which he published by subscription. With the profits of this work he commenced trade as a print-seller, and by his liberality to artists in general established a high reputation as a patron of ingenious men. Woollat was employed by him to engrave the celebrated pictures of *Niobe* and *Phaeton*, and he furnished other eminent artists with occupation, and was thus enabled to carry on an extensive foreign trade in English prints, which tended greatly to his own emolument and to the credit and advantage of his native country. Having at length established what may be termed an English school of engraving, he next turned his attention to the improvement of the art of painting. With that view he engaged the first artists in the kingdom to furnish the collection of pictures forming the well-known *Shakspeare Gallery*. The wars arising out of the French revolution having obstructed his continental trade, he was induced in 1804 to solicit an act of Parliament to permit him to dispose of his gallery and paintings by lottery. This he obtained, and lived long enough to see every ticket disposed of, but died before the lottery was drawn, on the 12th of December, 1804.

BOYER, ALEXIS, a celebrated French surgeon, born of poor parents at Uzerches in Limousin in 1757; died at Paris in 1838. Although in his younger years he had to struggle against poverty and disease, he attended the lectures of *Louis* and *Desault*, and after a brilliant career as a student obtained the degree of Master of Surgery in 1787. The revolution was of great advantage to him. He became successively surgeon to the *Hôpital de la Charité* and to the *Hôtel-Dieu*, and was appointed first surgeon to *Napoleon*, receiving at the same time the title of Baron of the Empire, with a dotation of 25,000 francs. He became a member of the Institute in 1825, and was consulting surgeon to *Louis XVIII.*, *Charles X.*, and *Louis Philippe*. His chief works are, *Traité d'Anatomie* (Paris, 1797-99); *Traité des Maladies Chirurgicales et des Opérations qui leur conviennent* (deux vols., 1814-26). He also contributed to the *Journal de Médecine* and the *Dictionnaire des Sciences Médicales*.

BOYER, JEAN PIERRE, president of the Republic of Hayti, born Feb. 28, 1776, at Port-au-Prince, died at Paris July 9, 1850. He was a mulatto by birth, but came early to Europe, where he obtained a European education. In 1792 he entered the army, and fought with distinction against the English in San Domingo, but was nevertheless obliged to evacuate the island, to which he did not return till 1802. At first he acted as leader of the mulattoes in the war against the negroes, but afterwards effected a union

between these in order to prepare the way for the complete independence of the island. When Péthion established a free state in the western part of the island, Boyer undertook the command of the troops which were concentrated in Port-au-Prince. After the death of Péthion, Boyer himself was elected president (1818). By his skilful military operations, not less than by his adroit diplomacy, he finally succeeded in uniting the eastern part of the island with the republic, and thus effecting the complete separation of the island from France and Spain (1825). He also purified the internal administration, raised the financial condition of the republic, and bestowed particular care upon its educational institutions. The contest between mulattoes and negroes, however, still went on, and in the end the latter rose in rebellion against him, which compelled him to leave the island (1848). He never returned to the place of his birth and of his long-continued activity, but lived for the rest of his life first in Jamaica, and afterwards in Paris.

BOYLE, a garrison town, Ireland, county Roscommon, 22 miles S.E. from Sligo, on a stream of the same name, connecting Lough Gara with Lough Key in a valley nearly surrounded by hills. It consists of four principal streets, crossing at right angles, two of which are straight, the other two winding; one of the latter ascends a very steep hill, all indifferently paved and kept. The more modern houses, many of which are of stone, are well built, but in the outskirts are many miserable hovels. Boyle has an Episcopal church and chapel of ease, a Roman Catholic and two Methodist chapels, national and other schools, a workhouse, courthouse, and bridewell, the latter a plain building, with freestone front. A large number of cattle is sold at the fair, which take place nine times a year. Pop. (1891), 2464.

BOYLE, CHARLES, the second son of Roger, earl of Orrery, was born in 1676 at Chelsea, and at fifteen entered a nobleman at Christ Church, Oxford, under the care of Dr. Atterbury. While there, he published a new edition of the epistles of Phalaris, of which Dr. Bentley questioning the authenticity, he wrote an answer entitled *Dr. Bentley's Dissertation on the Epistles of Phalaris examined*, which produced the famous controversy alluded to in the article **BENTLEY** (which see). On leaving the university in 1700 he was chosen member for Huntingdon; and on the death of his brother succeeded to the earldom, and was soon after elected a Knight of the Thistle, and received the command of a regiment. In 1709 he was promoted to the rank of a major-general, and sworn of the queen's privy-council; he was also envoy-extraordinary from the queen to the states of Flanders and Brabant, at the critical period of the Treaty of Utrecht; and on his return was raised to the dignity of a British peer, under the title of Lord Boyle. He retired from court soon after the accession of George I., and in 1722 was sent to the Tower on suspicion of being concerned in Laver's plot, but was discharged after six months' imprisonment. He constantly attended the House of Peers as before, but never spoke, though he was often employed in drawing up protests. Besides the edition of Phalaris, he published a comedy called *As you Find It*; a copy of verses to Dr. Garth upon his Dispensary; and a Prologue to Southerne's play of the Siege of Capua. He died in 1731. His name of Orrery was given to an astronomical instrument, invented by Mr. George Graham, whom he patronized.

BOYLE, JOHN, Earl of Cork and Orrery, only son of the subject of the preceding article, was born in 1707. He published, in 1739, an edition of the dramatic works of his great-grandfather Roger, earl of Orrery, and in 1742 his *State Letters*. His own

earliest publication was a translation of two odes of Horace in 1743, which work was followed in 1751 by his Translation of the Epistles of Pliny the Younger, with Observations on each Letter, and an Essay on Pliny's Life. This translation advanced his reputation as a polite scholar, but has since been eclipsed by the superior version of Malmoth. In 1754 he made the tour of Italy, and employed himself in collecting materials for a history of Tuscany, which he intended to write in a series of letters, twelve only of which have been published since his death. They are written in an agreeable manner, and contain some curious information respecting the Medici family. He died in 1769.

BOYLE, RICHARD, Earl of Cork, a statesman of note in the seventeenth century, born in 1666. In 1688 he went to Dublin with strong recommendations to persons in power, whose patronage he obtained. The state of Ireland at that time having rendered land very cheap, he took advantage of the circumstance to make some considerable purchases, among which was the estate of Sir Walter Raleigh, consisting of 12,000 acres in the counties of Cork and Waterford, which he obtained on easy terms. He was then appointed clerk of the council under Sir George Carew, the president of Munster, whom he accompanied in various expeditions against the Irish insurgents, in opposition to the English government. On these and other occasions he distinguished himself by his talents and activity, and rapidly augmented his political power and influence. King James I. appointed him privy-councillor for Munster, and afterwards for the Kingdom of Ireland; in 1616 he was made a peer of that realm by the title of Baron Boyle of Youghall, and in 1620 he was created Viscount Dungarvan and Earl of Cork. He was now in the height of his prosperity, living in his castle of Lismore in a style of grandeur more resembling that of a sovereign prince than of a private individual. In 1629 he was made one of the lords justices of Ireland, and in 1631 lord-treasurer of that kingdom. Like most of the English rulers of the sister island, he seems to have employed his power rather for the subjugation than the advantage of the native Irish. He built and fortified towns and castles, and introduced among the people arts and manufactures; but he put in force the severe laws of Queen Elizabeth against the Catholics, and transported multitudes of the ancient inhabitants from the fertile province of Leinster to the bogs and deserts of Kerry, supplying their place with English colonists. In 1641 the earl went to England as a witness against Lord Strafford, then under impeachment, having quarrelled with that nobleman during his vice-royalty. Soon after his return home the insurrection of the Irish broke out; on which event he displayed his accustomed activity, enlisting his tenantry under the command of his sons, and taking other measures for the defence of the country. But he lived only to see the commencement of the calamities of his adopted country, dying in 1643 or 1644. Lord Cork is principally memorable as the founder of a family, several individuals of which have highly distinguished themselves as cultivators of literature, science, and the arts; yet it should not be forgotten that he attained a high degree of contemporary fame, and was designated in the age in which he lived—'The great Earl of Cork.'

BOYLE, ROBERT, a celebrated natural philosopher, was born at Lismore, in Ireland, 1626, and was the seventh son of Richard the great earl of Cork. In 1638 he went to Geneva, under the care of a learned French gentleman, where he continued to pursue his studies for several years. In 1641 he made a journey to Italy. In 1642 he was left at Marcellus

destitute of money, on account of the breaking out of the Irish rebellion. This circumstance did not allow him to return to England until 1644. During this period his father had died, leaving him considerable property. He now went to his estate at Stalbridge, where he devoted himself to the study of physics and chemistry. He was one of the first members of a learned society founded in 1645, which at first went under the name of the Philosophical College. On account of the political disturbances this society retired to Oxford, but was revived after the restoration under the name of the Royal Society. Boyle occupied himself at Oxford in making improvements in the air-pump. Like Bacon, he esteemed observation the only road to truth. He attributed to matter merely mechanical properties. Every year of his life was marked by new experiments. We are indebted to him, indirectly, for the first certain knowledge of the absorption of air in calcination and combustion, and of the increase of weight which metals gain by oxidation. He studied the chemical phenomena of the atmosphere, and was thus a predecessor of Mayow, Hales, Cavendish, and Priestley. In all his philosophical inquiries he displayed an accurate and methodical mind, relying wholly upon experiments. At the same time, his imagination was warm and lively, and inclined to romantic notions, which were first produced, in his childhood, by the perusal of *Amadis de Gaul*, and always exercised a visible influence on his character. He was naturally inclined to melancholy, and this temper of mind was increased by circumstances. The sight of the great Carthusian monastery at Grenoble, the wildness of the country, as well as the severe ascetic life of the monks, made a deep impression upon him. The devil, as he said, taking advantage of his melancholic disposition, filled his soul with terror, and with doubts concerning the fundamental doctrines of religion. This condition was so insufferable, that he was tempted to free himself from it by committing suicide, and was only prevented by the fear of hell. While endeavouring to settle his faith, he found those defences of the Christian religion which had been published before his time, unsatisfactory. In order, therefore, to read the original works, which are considered the foundation of Christianity, he studied the oriental languages, and formed connections with Pococke, Thomas Hyde, Samuel Clarke, Thomas Barlow, &c. The result of his studies was a conviction of its truth, which was manifested not only by his theological writings, but by his benevolence and generous disinterestedness. He instituted public lectures for the defence of Christianity, devoting an annual sum to the payment of a lecturer. The first series of these lectures was delivered by the distinguished scholar, Richard Bentley, in 1692. Among the other celebrated men who have at different times been appointed Boyle lecturers may be mentioned Samuel Clarke, in 1705; Whiston, the translator of *Josephus*, in 1709; and F. D. Maurice, in 1846. These lectures are only printed occasionally, and at long intervals. A collection embracing those delivered between 1692 and 1732 was published in 1739 (London, three vols.). Boyle did much for the support of the mission in India, and caused Irish and Gaelic translations of the Bible to be made and printed at his own expense. To his religious principles were united the purest morals, a rare modesty, and an active benevolence. He died at London in 1691, and was interred in Westminster Abbey. Birch published an edition of his works, five vols. folio, London, 1744.

BOYLE, ROGER, Earl of Orrery, fifth son of the first Earl of Cork. He was born in 1621, and when only seven years old was created Baron Broghill, by which

title he is usually known. He was educated at Trinity College, Dublin; after which he travelled on the Continent, and returned home at the commencement of the Irish rebellion. He commanded a troop of cavalry raised by his father, was employed in the defence of the castle of Lismore, and displayed his courage and ability on many occasions in the service of Charles I.; on the cessation of whose authority he acted under the parliamentary commissioners in Ireland. When the king was put to death he retired for a while from public life; but being courted by Cromwell, he accepted a commission from him, and assisted him materially in reducing the Irish to subjection. He served his new master with seal and fidelity, and few persons were more trusted or distinguished by him. Oliver becoming Protector, made Lord Broghill one of his privy-council and a member of his House of Lords. In 1656 he sent him to Scotland, with a commission to govern there with absolute authority for one year; and his conduct was such as proved satisfactory both to the Scots and the Protector. On the death of Cromwell, becoming aware of the approaching restoration of regal power, he exerted himself with such dexterity and success in promoting it as to obtain much credit for his conduct. Charles II. rewarded him with the title of Earl of Orrery, and he was appointed one of the lords justices for Ireland. He died October 16, 1679.

BOYNE, a river of Ireland, running into the Irish Channel, near which was fought a celebrated battle between the adherents of James II. and William III., in 1690; the latter proved victorious, and James was obliged to flee to the Continent. The river rises in the Bog of Allen, and after a winding course of about 60 miles, falls into the sea 4 miles N. by N. of Drogheda.

BOZZARIS, MARCOS, a hero of the Greek war of Independence against the Turks, was descended from a Suliot family renowned for its bravery, and was born about the end of last century. After the fall of Sulî he retired to the Ionian Islands, from whence he made a vain attempt to deliver his native country. He then entered an Albanian regiment in the French service, and in 1813 became a member of the Heteria, a society formed for national regeneration. In 1820, when the Turks were carrying on war against Ali Pasha, the latter sought aid from the exiled Suliotes, and Marcos Bozzaris returned to Epirus. On the outbreak of the war of Independence he at once joined the Greek cause, and distinguished himself as much by his patriotism and disinterestedness as by his military skill and personal bravery. In 1822 he took part in the war which was going on in Western Greece, and acquired special renown by his defence of Missolonghi. In the summer of 1823, when he held the command-in-chief of the Greek forces in that port, he was dangerously wounded at a night attack on the camp of the Pasha of Scutari, near Karpenisi, and died soon after at Missolonghi. His deeds are still celebrated by the Greeks in many popular songs. His brother Koeta (Constantine) was also one of the noblest characters connected with the same war. He died at Athens Nov. 18, 1853, as general and senator. See *GREECE*.

BOZZOLO, a fortified town in Italy, Lombardy, province of Cremona, and 16 miles W.W. Mantua, near the right bank of the Oglio, with old fortifications, some silk looms, and an annual fair. Pop. 4049.

BRA, a town in Italy, Piedmont, province of Cuneo, 9 miles W.W. Alba. It has three parish churches, the principal of which is the Church of Santa Chiara, built in 1742 by Vettones. The town has a good trade in cattle, grain, wine, and silk, which last is held in high repute. Pop. 9125.

BRABANÇONNE, the national song of the Belgians during the revolution of 1830, composed by Jenneval, at that time an actor at the theatre of Brussels, and set to music by Campenhout. Every verse of the song ends with the refrain:

*‘La mitraille a brisé l’orange
Sur l’arbre de la liberté’.*

BRABANT is the central district of the lowlands of Holland and Belgium, extending over an area of 4841 square miles, from the left bank of the Waal to the sources of the Dyle, and from the Meuse and the plains of Limburg to the lower Scheldt. In the middle ages it formed a separate independent duchy, called Lower Lorraine. It is divided at present between the kingdoms of Holland and Belgium, into three provinces:—1st, Dutch or North Brabant, with an area of 1980 sq. m., and a pop. (in 1896) of 539,725; 2nd, the Belgian province of Antwerp, with an area of 1093 sq. m., and a pop. (in 1896) of 784,975; and 3rd, the Belgian province of South Brabant, with an area of 1268 sq. m., and a pop. (in 1896) of 1,212,686. The country is comprehended in a plain, gently sloping to the s.w., which is occupied in the s. by heathy and marshy tracts, and in the s. passes into the gentle rising ground which forms the first ascent of the forest of Ardennes. It is copiously watered by the Meuse in the s. and the Scheldt in the s., in the former of which the internal transit is furthered by means of canals, among others the South William and the Breda Canals, and in the latter by railways, which have their point of union at Mechlin. Under the influence of a northerly, indeed, and moist, but in general healthy and mild climate, the great fertility of the soil renders agriculture and the rearing of cattle the principal and most profitable employment of the inhabitants. With this is associated the general diffusion of an active industry, which supports an extensive trade, consisting chiefly of lace, cotton, woollen, and leather goods.

Through Cæsar's campaigns the Romans became acquainted with the inhabitants of Brabant as a mixed race of Germans and Celts. The Menapians, particularly, inhabiting the country between the Rhine, the Meuse, and the Scheldt, made, as the most powerful and warlike among the various tribes, a gallant, though ultimately ineffectual resistance to the Roman arms, by whose conquests this portion of Lower Germany was incorporated with the province of Gallia Belgica. In the fifth century the Franks gained possession of Brabant, which in the sixth was, at the partition of the Frank kingdom, assigned to the primitive country of Austrasia; in the ninth century it was united to Lorraine; and on the division of the latter, in 870, became the property of France, from which, however, in the commencement of the tenth century, it was transferred by Henry I. again to Lorraine; in 959 to Lower Lorraine, and thus to Germany. In the beginning of the eleventh century it was separated from Lorraine, on Duke Otho, the son of Charles the Fat, who had been invested by the Emperor Otho with Lower Lorraine, dying childless in 1005. After this several Counts of Ardennes and Godfrey of Bouillon possessed it till 1076; the Emperor Henry V. mortgaged it to Godfrey the Bearded, of the family of the Counts of Louvain and Brussels, whose house reigned over Brabant to the middle of the fourteenth century. As early as 1190 we find the title of Duke of Brabant, in which the former title of Duke of Lower Lorraine or Lothier was gradually absorbed. Under the government of its own dukes Brabant gained rapidly in power and independence, but was engaged in numerous contests with its neighbours, and shifted

much in its leanings between Germany and France. Of the six dukes of Brabant, Henry I. II. and III. and John I. II. and III. there are more especially to be mentioned John I., who, by the celebrated battle of Wöringen (1288), united Limburg to Brabant, and is also renowned in Germany as a minnesinger or troubadour, and John III., who, in 1349, received from the Emperor Charles IV. the important privilege of a free judicature, under the name of the Brabantine Golden Bull, in consequence of which his subjects ceased to be amenable to any foreign jurisdiction. With John III. the heirs male of the family of the Counts of Louvain became extinct in 1355, and, by the bequest of his daughter Joanna, who reigned till 1406, and married Wenceslaus of Luxemburg, Brabant came into the possession of the house of Burgundy, and in the first instance to Antony of Burgundy, Joanna's grand-nephew, and second son of Philip the Bold. On Antony's death at the battle of Agincourt, in 1415, and his two successors, his son John IV. and his brother Philip, count of St. Pol, dying childless respectively in 1427 and 1430, Brabant, as the inheritance of Philip the Good, became formally incorporated with the dominions of the house of Burgundy. In this state, however, it did not long continue, and, by the marriage of Mary of Burgundy with the Emperor Maximilian, was transferred to the house of Austria, and subsequently to the Emperor Charles V., who abdicated in favour of his son, Philip II. of Spain. The persecuting edict of the latter, and the Duke of Alba's cruelties, excited a revolt in Brabant, but it was only the northern portion (Hertogenbosch) which succeeded in asserting its independence, and in 1648 was incorporated with the United Provinces under the name of the Generality Territory, whilst South Brabant remained till 1714 in the possession of the Spaniards. On the extinction of the Spanish Austrian line in the latter year, Brabant, with the other southern provinces of the Netherlands, reverted to the imperial house of Austria, which, however, was unable long to retain it in peace. On a violent contest breaking out under the Emperor Joseph II., as to the explanation of the provincial privileges which Brabant possessed under the Joyeuse Entrée (which see), and the consequent dismissal of the Assembly of the states of Brabant and Limburg, the Brabantines assembled of their own authority, and boldly pronounced the separation of Brabant from the supremacy of the house of Austria. Leopold II. settled the dispute after Joseph's death by granting their ancient privileges to the people of Brabant. The remainder of the history of Brabant will be found under BELGIUM.

BRACCIO DA MONTONE, ANDREA, a celebrated Italian captain, born at Perugia, of the illustrious family of the Fortebracci, in 1368, early embraced the profession of arms, and entered the service of Ladislas, king of Naples, under the promise that he, if successful, would make him master of Perugia; but when the Perugians, determined to keep out Braccio, offered to open their gates to Ladislas if he would retain it for himself, he broke faith with Braccio, and accepted their terms. Braccio next served under Florence, afterwards attaching himself to Pope John XXIII., who, on repairing to the Council of Constance, where he was deposed, intrusted Braccio with the defence of Bologna. Ladislas being now dead, and the church without a head, Braccio saw that the moment for which he had waited had arrived; and allowing the Bolognese to redeem their liberty by a money payment, suddenly, in 1416, pounced on Perugia. The Perugians vainly endeavoured to resist, and saw themselves compelled to receive Braccio as their lord. His rule, though

firm and occasionally severe, was milder than might have been anticipated; and he soon showed that his wisdom as a statesman was not less than his ability as a captain. Though Braccio had now gained the great object of his life, ambition led him to attempt the conquest of Rome, and he gained several advantages over Sforza, who had long been his rival. Ultimately, however, the new pope, Martin V., proved more than a match for him, and Braccio, defeated and severely wounded, took the disgrace so seriously to heart that he would neither take food nor allow his wounds to be examined, and died in 1424.

BRACELET, a kind of ornament usually worn on the wrist, the use of which extends from the most ancient times down to the present, and belongs to all countries, civilized as well as uncivilized. The word has come to us from the French and is ultimately derived from *brachium*, the Latin word for the arm. Bracelets were in use in Egypt at a very remote period. They were of different colours, which were painted on them in enamel in very bright as well as very delicate shades. They were also then as now frequently made of gold, encased with various kinds of precious stones. They were not always worn, as with us, on the wrist, but frequently on the upper part of the arm. The ancient Medes and Persians were well known to be extremely fond of this method of adorning themselves; and in the Bible the bracelet is frequently mentioned as an ornament in use among the Jews, both men and women. Among the ancient Greeks, in historical times, bracelets do not appear to have been worn by the men; but, on the other hand, they were worn by the Greek ladies, made of every variety of material, and in every possible form. A preference was generally given to the spiral form, and a bracelet of this kind is described by Homer in the *Iliad*. Very frequently the spiral bracelets were made to assume the appearance of snakes, which went round the arm twice or thrice, or even a greater number of times. Among the ancient Italian tribes bracelets were also an ornament of the men. The Sabines often wore very heavy ones on the left arm. Among the Romans it was a frequent practice for a general to bestow bracelets on soldiers who had distinguished themselves by their valour. Roman ladies of high rank frequently wore them both on the wrist and on the upper arm. The Arabs and the orientals generally use them, chiefly as an ornament for women. Among the ancient heathen Germanic tribes they formed the chief and almost only ornament, as is shown by their being so often found in old graves. The men seem to have used them even more than the women, for bracelets have been found in dozens on the arms of the former. The spiral was the favourite form with the ancient Germans as with the ancient Greeks.

BRACHIOPODA (Gr. *brachion*, an arm, and *pous*, podas, a foot), the name given to a class of marine animals often classed among Molluscoides and formerly with Mollusca, subdivided into two orders, Articulata (Hinged Brachiopoda) and Inarticulata (Hingeless Brachiopoda), comprising numerous families. Their shell is bivalve, and in this respect they resemble the Lamellibranchiata; but they are chiefly characterized by having an always open mantle, with two lobes, around the internal face of each of which the gills are arranged in small laminae, and in having, two very singular, elongated, ciliated, and fleshy labial organs or arms, provided with numerous filaments, which when used are stretched out beyond the shell, but when at rest are rolled up spirally within it. They have no proper power of locomotion, and remain fixed to submarine bodies. They are widely diffused, but were in former ages much more

numerous than now, and in the fossil state are interesting to the geologist by enabling him to identify certain strata. Among the chief genera are *Rhynchonella*, *Terebratula*, *Lingula*, *Spirifer*, *Productus*, and *Crania*.

BRACHYURA. See **CRUSTACEA**.

BRACKEN (*Pteris aquilina*), a well known species of polypodiaceous fern, forming the type of the subfamily Pterideae. It has a black, creeping rhizome, from which are sent up large, handsome bipinnate fronds. The sori are arranged along the margins of the pinnules, and are covered by a false indusium formed of the reflexed margin. The bracken or brake is very common in the United Kingdom, and frequently covers large extents of country. Its rootstock was at one time used for food, but it is neither palatable nor nutritious; that of a New Zealand species (*P. esculenta*) is better suited for this purpose. Various medicinal virtues have been at one time or another ascribed to it, but it is not now used in medicine. The ash produced by burning the fronds has been employed in making soap. Other species are met with in various parts of the world.

BRAC, a leaf, from the axil of which a flower or flower-stalk proceeds, and thus distinguished from the ordinary leaf, from the axil of which the leaf-bud proceeds. Bracts may thus be entirely similar to the ordinary leaves of a plant, and in that case they are called leafy bracts; but very commonly they are somewhat changed in form, and although they may be sometimes divided, they are for the most part entire, even when the ordinary leaves are divided. In some cases they are so much changed in form as to be mere scales or threads, and sometimes they are not developed at all, in which case the inflorescence is said to be ebracteate. Owing to the different ways in which the bract appears, it may in some plants be confounded with the calyx, in others with the corolla. When the flowers of a plant are sessile, the bracts are often applied closely to the calyx, and are thus apt to be confounded with it; and when the bracts are coloured, they are apt to be mistaken for parts of the corolla. When the inflorescence of a plant is branching, subordinate flower-stalks proceeding from one main flower-stalk, bracts are often seen at the base of the former, and these are called bracteoles. A spathe is a kind of large bract.

BRACTEATES, thin coins of gold or silver, with irregular figures on them, stamped upon one surface only, so that the impression appears raised on one side, while on the other it appears hollow. They were largely circulated under Otto I., emperor of Germany, and derive their name from *bractea*, signifying leaf of gold or other metal. They are of importance as illustrating history.—*Bracteated coins*, or *bracteati nummi*, is a term used to signify coins or medallions covered over with a thin plate of some richer metal. They were usually made of iron, copper, or brass, plated over and edged with gold or silver leaf. Some of them are to be found even among the truly ancient coins.

BRAC, HENRY DE, one of the earliest writers on English law, flourished in the thirteenth century. He studied civil and canon law at Oxford, and about the year 1244, Henry III. made him one of his judges itinerant. Some writers say that he was afterwards chief-justice of England; but his fame at present is derived from his legal treatise entitled *De Legibus et Consuetudinibus Angliæ*, which was first printed in 1569 (folio). The quarto edition of 1640 was merely a reprint of the first. In 1878-83 Sir Travers Twiss issued a recension and translation in six volumes.

BRADDOCK, EDWARD, a British commander, was the son of a lieutenant-colonel of the Coldstream

Guards, and was born in 1695. He entered his father's regiment in 1710, became captain and lieutenant-colonel in 1736, major-general in 1754, and the same year was appointed commander of the British army in America intended to act against the French on the river Ohio. Having arrived in Virginia in February, 1755, he marched against Fort du Quene, now Pittsburgh. He reached the Monongahela July 8, and next day moved forward to invest the fort. Disregarding, however, the caution of his provincial officers, who warned him of the danger of surprise in an Indian war, he fell into an ambuscade, by which he lost nearly one-half of his troops and received himself a mortal wound. The army was obliged to make a precipitate retreat, in the course of which Braddock expired.

BRADFORD, a municipal, parl., and county borough, and city of England, in the W. Riding of Yorkshire, 8 miles west of Leeds. It is pleasantly situated on a feeder of the Aire, at the junction of three extensive valleys, and consists of an ancient and a more modern portion, the latter with spacious, well-built streets. The appearance of the town has been almost completely changed since 1861, the corporation having at a great expenditure of money effected most extensive street improvements, widening the principal thoroughfares, improving the gradients, and opening up new streets. Spacious covered markets have been erected at a great cost. Among the public buildings are the town-hall (1873), costing £140,000, in French Gothic style; St. George's Hall, erected in 1851, and capable of accommodating about 5000 persons; an exchange, containing a statue of Cobden; a temperance hall; a mechanics' hall, with lecture rooms and library; a technical college, costing about £32,000, opened in 1882; free library (1872); a new post-office, opened in 1887; and two court-houses. The parish church of St. Peter is in Perpendicular style, and has a fine oak roof. The schools include the free grammar-school, endowed by Charles II., the girls' grammar-school, and the board schools. In Airedale College young men are trained for the ministry among the Independents. Among the charitable institutions may be noticed the infirmary, the eye and ear hospital, the children's hospital, St. Catharine's Home, an institution for the blind, and almshouses. There is a fever hospital, to which patients are admitted at moderate charges, and when persons are too poor to pay, the corporation bear the cost. There is also a smallpox hospital. Bradford has several public parks, some of them finely laid out, besides Baildon Moor (600 acres) reserved for recreation purposes. There is an extensive system of water-works by gravitation which has cost over £2,000,000, affording a constant supply of about 10 million gallons a day, and a large extension is in progress. Water, gas, and electric supply undertakings are owned by the municipality. The worsted yarn and stuff trade is the principal industry; there are also alpaca and mohair manufactures (with which Sir Titus Salt's name is connected), manufactures of silk and velvet (the Manningham Mills of Lister and Co. cost £500,000), mixed cotton and silk goods; and some cotton factories. In the neighbourhood are quarries and iron-works. Bradford has ample facilities for railway communication. The town was incorporated in 1847, and its affairs are managed by a mayor, 21 aldermen and 68 councillors. It was accorded the rank of a city in 1897. The three parliamentary divisions of Central, East, and West Bradford each send one member to Parliament. Pop. of parl. bor. in 1881, 180,459; of mun. bor., 183,032; of mun. and parl. bor. in 1891, 216,361; of mun. bor. in 1901, 279,809; parl. bor., 228,667.

BRADFORD-ON-AVON, an ancient market-town of England, in the county of Wilts, beautifully situated 28 miles N.W. of Salisbury, on both banks of the Lower Avon, which is here crossed by two bridges—a very old one of nine arches in the centre of the town, and a modern one, Barton Bridge, of four. The town chiefly consists of three regular streets, containing many handsome houses. There is a good parish church of the Holy Trinity, in the Norman and subsequent styles, with several interesting relics; a town-hall, in Elizabethan style; and some interesting old buildings. Among the latter is the small but unique church of St. Lawrence, the only complete specimen of Anglo-Saxon architecture still existing. It was built in the eighth century, and consists of a chancel, a nave, and a porch on the north side. Woollen cloth is manufactured, but this industry has declined. Bradford was of some note in Anglo-Saxon times, St. Dunstan having been elected Bishop of Worcester at a synod held in it. Pop. in 1871, 4871; in 1891, 4943; in 1901, 4514.

BRADFORD, JOHN, Protestant martyr and theologian, born at Manchester about 1510, obtained a situation in the commissariat, and having been guilty of some defalcation, known only to himself, was so impressed by a sermon of Latimer on restitution, that he determined not only to sell everything he had in order to make up the defalcation, but to renounce an employment which exposed him to dangerous temptations. He afterwards studied at Cambridge, where he received the degree of M.A. His modesty, notwithstanding the urgency of his friends, and among others the celebrated Martin Bucer, would not allow him for a long time to undertake the duties of a clergyman; but at last, in 1550, his scruples were overcome, and on taking orders he was appointed chaplain to the Bishop of London, and Canon of St. Paul's. From this time he devoted himself to the duties of his office with so much zeal and success that he became one of the most popular preachers of his day. In 1552 he was appointed chaplain to Edward VI. That amiable prince died in the following year, and under the reign of Queen Mary, Bradford at once became a marked man. On the charge of preaching sedition he was committed to the Tower (occupying the same room with Ridley, Cranmer, and Latimer), and being brought to trial, was condemned to death as an obstinate heretic. The Roman Catholics, knowing his popularity, would fain have gained him over to their side, but he remained inflexible. His life is said to have been offered to him if he would only promise to refrain from preaching, but even this he had the manliness to refuse, and he was burned at the stake in Smithfield in 1556. A complete edition of his works, which include sermons, meditations, various treatises, &c., was published in 1848-53 (2 vols.).

BRADLEY, JAMES, a celebrated astronomer, was born at Sherborne, Gloucestershire, in 1693. He was educated at Balliol College, Oxford, and took orders, becoming vicar of Bridstow in 1719, and rector of Llandewi-Velfry, Pembrokeshire, in the following year; but his taste for astronomy soon led him to change his course of life. His uncle, the Rev. James Pound, had instructed him in astronomy, his own industry did everything else, and in 1721 he was appointed Savilian professor of astronomy at Oxford. Seven years afterwards he made known his discovery of the aberration of light. But although this discovery gave a greater degree of accuracy to astronomical observations, and although the discrepancies of different observations were much diminished, yet slight differences remained, and did not escape his observation. He studied them during twenty years with the greatest perseverance, and finally discovered that they

were fully explained by the supposition of an oscillating motion of the earth's axis, completed during a revolution of the moon's nodes, that is, in about eighteen and a half years. He called this phenomenon the *nutation of the earth's axis*; and published his account of it in 1748. By these two discoveries astronomers were, for the first time, enabled to make tables of the motions of the heavenly bodies with the necessary accuracy. Bradley had already, in 1726, explained the method of obtaining the longitude by means of the eclipse of Jupiter's first satellite. In 1742, at the death of Dr. Halley, he received the office of astronomer royal, and removed to the observatory at Greenwich. Here he spent the remainder of his life, entirely devoted to his astronomical studies. He died at Chalford, in Gloucestershire, 13th July, 1762. He left thirteen volumes folio of his own observations in manuscript. The whole appeared under the title of *Astronomical Observations made at the Observatory at Greenwich, 1750-62* (Oxford, 1798, 1806, two vols. folio). From this rich mine have been taken thousands of observations, on the sun, moon, and planets, of the highest astronomical value.

BRADSHAW, JOHN, president of the court which tried and condemned Charles I., was the son of a county gentleman, and was born in 1602. He studied law at Gray's Inn, and obtained much chamber practice from the partisans of the Parliament, to which he was zealously devoted. When the trial of the king was determined upon, the resolute character of Bradshaw pointed him out for president, which office, after a slight hesitation, he accepted (January, 1649). His deportment on the trial some describe as lofty and unbending, others as harsh and overbearing. He was subsequently appointed permanent president of the council of state, and received other honours. He rendered himself obnoxious to Cromwell, when the latter seized the protectorate, and was deprived of the chief-justiceship of Chester. On the death of Cromwell (1658), and the restoration of the Long Parliament, he obtained a seat in the council, and was elected president. He died in 1659, and on his death-bed asserted that, if the king were to be tried and condemned again, he would be the first to agree to it. He was magnificently buried in Westminster Abbey, whence his body was ejected, and hanged on a gibbet at Tyburn, with those of Cromwell and Ireton, at the Restoration.

BRADY, NICOLAS, born in 1659 at Bandon, in Ireland, was educated at Westminster School, and afterwards received the degree of B.A. both at Oxford and at Dublin, and took orders in the Irish Church. Having come to England he obtained several ecclesiastical preferments; among others the rectory of the church of St. Catharine Cree, London, and that of Richmond, Surrey. This put him in possession of an income which might, but does not seem to have sufficed for his wants, as he thought it necessary to increase it by keeping a school at Richmond. His largest work, a translation of the *Æneid* was an absolute failure, but he has made his name a kind of household word, at least in England, by executing, in concert with Nahum Tate, that metrical version of the Psalms which soon came to be commonly used in the Episcopal Church. He died in 1726.

BRAGA, a town in Portugal, capital of the province of Minho, and the seat of an archbishop who is primate of Portugal, is charmingly situated on a rising ground between the Cávado and D'Este, about 32 miles N.W. of Oporto. It is surrounded by walls flanked with towers, and defended by a castle. The houses are old, the streets broad, but not well laid out. It contains an archiepiscopal palace, a richly

ornamented Gothic cathedral of the thirteenth century, parish churches, monasteries, a college, &c. The manufactures are of some importance. Braga is supposed to have been founded by the Carthaginians, and there exist remains of a Roman temple, amphitheatre, and aqueduct. On a hill some distance east of the town stands the famous pilgrimage church of Bom Jesus do Monte. Pop. (1890), 23,089.

BRAGANZA, or BRAGAÇA, one of the oldest towns of Portugal, capital of the province Trás-os-montes. From its dukes the present reigning family of Portugal are descended. The town and surrounding district still belong to the King of Portugal as Duke of Braganza. Pop. 5000. See PORTUGAL.

BRAHAM, JOHN, a celebrated tenor singer, of Jewish extraction, was born in London in 1774, and made his first appearance as a vocalist at the age of ten. On attaining manhood he proceeded to France and Italy with the view of improving himself in his art, and accomplished this so successfully, that on his return after an absence of several years he soon rose to the position of the first English singer of his day. He sung much in opera, but gained his greatest triumphs in national songs, such as 'The Bay of Biscay, O', and 'The Death of Nelson', and till within a few years of his death he continued to appear in public. He died on 15th February, 1856. His sons, Charles, Augustus, and Hamilton, also adopted the musical profession.

BRAHE, TYCHO DE. See TYCHO.

BRAHLOW, BRAHLOW, or BRAILA, a town and port of Roumania on the left bank of the Danube, about 12 miles above Galatz, and over 120 from the Sulina mouth of the river. It is accessible by large sea-going vessels, and carries on a great trade in the export of grain, importing coal, agricultural machinery, &c. Both as regards accommodation for shipping and otherwise it has been much improved in recent years. In the Turkish wars of the latter half of the eighteenth century Brahlów was several times besieged and taken by the Russians. In 1828 it had to surrender to the Russians after a gallant resistance, but in 1829 the Peace of Adrianople restored it to the Turks. Pop. (1894), 51,116.

BRAHMA, the first person in the Triad, or Trimurti of the Hindus, which consists of *Brahma* the creator, *Vishnu* the preserver or redeemer, and *Siva* the destroyer. He is represented with four heads and as many arms, and the swan is consecrated to him. He is the god of the fates, master of life and death, and, by some, has been represented as the supreme eternal power; but he is himself created, and is merely the agent of Brahmā (a neuter noun), the Universal Power or Ground of all Existence. His moral character is no better than that of the Grecian Zeus. He is considered as the author of the Vedas, and as the law-giver and teacher of India. The worship of Brahma is regarded as the oldest religious observance in that country. See next article, and also INDIA—Religions.

BRAHMANS, the first of the four castes of the Hindus. They proceeded from the mouth of Brahma, which is the seat of wisdom. They form the sacred or sacerdotal caste, whose members have maintained perhaps a more absolute and extensive authority than the priests of any other nation. Their great prerogative is that of being the sole depositaries and interpreters of the Vedas, or sacred books. There are seven subdivisions of the Brahmans, which derive their origin from seven penitents, personages of high antiquity and remarkable purity, who are said to have rebuked the gods themselves for their debaucheries. The great body of the Brahmans pay equal veneration to the three parts of the mysterious trinity, but some attach themselves more particularly

to one person of the triple godhead. Thus the Vishnavites are distinguished by an orange-coloured dress, and the mark called *namo* on their foreheads. The devotees of Shiva wear the *kapas*, and are distinguished from the former by their great abstemiousness. A Brahman should pass through four states. The first begins at about seven, when the duty of the young novice, or *Brāhmachari*, consists in learning to read and write, studying the Vedas, and becoming familiar with the privileges of his caste, and all matters of personal purity. Thus he is taught his right to ask alms, to be exempted from taxes, from capital and even corporal punishment. Earthen vessels belonging to Brahmins, when used by profane persons, or for certain purposes, must be broken. Leather and skins of animals, and most animals themselves, are impure, and must not be touched by them. Flesh and eggs they are not allowed to eat. The Brahman is also taught to entertain a horror of the defilement of the soul by sin; and rules for purification by ablution, penances, and various ceremonies, are prescribed. The second state begins at his marriage, when he is called *Grihastha*. Marriage is necessary to his respectability. His daily duties become more numerous, and must be more strictly performed. Regular ablutions, fasting, and many minute observances, become requisite. The Brahmins, however, engage in secular employments, political, commercial, &c. The third state is that of the *Vana-Prastha*, or inhabitants of the forest, which is now, however, seldom reached. They were honoured by kings, and respected even by the gods. Retiring to the forest, green herbs, roots, and fruit were their food: reading the Vedas, bathing morning, noon, and evening, and the practice of the most rigorous penances were prescribed. 'Let the *Vana-Prastha*,' says Manu, in the Institutes, 'alide backwards and forwards on the ground, or stand the whole day on tip-toe, or continue rising and sitting down alternately; in the hot season, let him sit exposed to fire; in the rain, let him stand uncovered; in the cold season, let him wear wet garments; then, having stored up his holy fire in his mind, let him live without external fire, without a shelter, wholly silent, and feeding on roots and fruit. When he shall have thus become void of fear and sorrow, and shaken off his body, he rises to the divine essence.' The fourth state is that of a *Sannyasi*, in which new and severer penances are to be performed. Suppressing the breath, standing on the head, and other such ceremonies are performed, till the devout patient rises to a participation of the divine nature. The sanctity and inviolability of a Brahman are maintained, in the eyes of his countrymen, by the most severe penalties. The murder of one of the order, robbing him, &c., are inexpressible sins: the killing of his cow can only be expiated by a painful penance. To some travellers it appears that the number of Brahmins respectable for knowledge and virtue is very small; that the great body of them are devoted to ambition, intrigue, and voluptuousness, and that their character is disgraced by avarice, meanness, and cruelty. Their charity extends only to those of their own caste. The objects of their worship, besides their innumerable gods, are almost every species of animals, and a variety of malignant demons. The transmigration of souls is one of their essential doctrines, and they believe in the existence of a hell. Some of the ceremonies of the Brahmanical worship are horrible: some are more licentious than the orgies of Bacchus. The sacrifices commonly consist of vegetables, but animals are sometimes sacrificed. See INDIA—Religion.

BRAHMAPUTRA, a large river of Asia, which has its course partly in India, and whose sources, not

yet explored, are situated near Lake Manasarovar, in Tibet, near those of the Indus. In Tibet, where it is called the Sampo, it flows eastwards north of the Himalayas, and, after taking a sharp bend and passing through these mountains, it emerges in the north-east of Assam as the Dihong; a little further on it is joined by the Dibong and the Lohit, when the united stream takes the name of Brahmaputra. After entering Bengal it joins the Ganges at Goalanda, and further on the Meghna, and their united waters flow into the Bay of Bengal. The Brahmaputra is navigable by steamers for about 800 miles from the sea, its total length being, perhaps, 1800. Rising from opposite sides of the same mountains, the Brahmaputra and the Ganges mingle their waters at last in the same channel.

BRAIDWOOD, THOMAS. See DRAF AND DUMB.

BRAILA. See BRAHLOW.

BRAILS, certain ropes passing through pulleys on the mizen-mast (see SHIP), and afterwards fastened in different places, on the hinder edge of the sail, in order to draw it up to the mast, as occasion requires. *Brails* is likewise a name given to all the ropes employed to haul up the bottoms, lower corners, and skirts of the great sails in general. The operation of drawing them together is called *brailing* them up, or hauling them up to the *brails*.

BRAIN. The brain is a soft substance, partly reddish-gray, and partly whitish, situated in the skull, penetrated by numerous veins, and invested by several membranes. Democritus and Anaxagoras dissected this organ almost 3000 years ago. Haller, Vieq d'Azir, and other anatomists in modern times, have also dissected and investigated it without exhausting the subject. Between the skull and the substance of the brain three membranes are found. The outer one is called the *dura mater*. This is strong, dense, and elastic. It invests and supports the brain. The next which occurs is the *tunica arachnoidea*. This is of a pale white colour, yet in some degree transparent, very thin, and in a healthy state exhibits no appearance of vessels. The membrane below this is called the *pia mater*. It covers the whole surface of the brain. It is very vascular, and a great portion of the blood which the brain receives is spread out upon its surface in minute vessels. The brain consists of two principal parts, connected by delicate veins and fibres. The large portion, the *cerebrum*, occupies, in man, the upper part of the head, and is seven or eight times larger than the other, the *cerebellum*, lying behind and below it. It rests on the bones which form the cavities of the eyes, the bottom of the skull and the *tentorium*, and projects behind over the cerebellum. On the whole exterior of the cerebrum there are convolutions, resembling the windings of the small intestines. The external reddish substance of the brain is soft and vascular, and is called the *cortical substance*; the internal is white, and is called the *medullary substance* of the brain. This medulla consists of fibres, which are very different in different parts. The cerebellum lies below the cerebrum, in a peculiar cavity of the skull. By examining the surface it is seen to be divided into a right and left lobe, by the spinal marrow lying between, but connected at the top and bottom. Like the cerebrum, it is surrounded by a vascular membrane, reddish-gray on the outside, and composed of a medullary substance within. In proportion to its size, also, it has a more extensive surface, and more of the vascular membrane than the cerebrum. In a horizontal section of it, we find parallel curved portions of the cortical and the medullary substances alternating with each other. Between the cortical and the medullary substance there is always found, in the cerebellum, a third intermediate

yellow substance. All the medulla of the cerebellum is also united in the middle by a thick cord. Experience teaches that, in the structure of the brain, irregularities are far more uncommon than in other parts of the human body. It is worthy of observation, that every part of the brain is exactly symmetrical with the part opposite. Even those which lie in the middle, and are apparently single (the spinal marrow, for instance), consist, in fact, of two symmetrical portions. Twelve pairs of nerves proceed from the brain, including the nerves for the organs of smell, of sight, of hearing, and of taste, also those for the skin and muscles of the face, those for the cavity of the mouth and for the larynx. The chemical constituents of the brain may be divided into three classes. The first class includes water and the salts, chloride and carbonate of soda and of potash, and phosphates and carbonates of lime. The second class includes cholesterine, oleine, and other principles the nature of which has not yet been determined. To the third class belongs, so far as has yet been ascertained, only the cerebral albumen. When compared with the brain of other animals, the human brain presents striking differences. Even the brain of the higher classes of the inferior vertebrate animals differs from that of man, especially in the degree of development, while among the lower grades there is sometimes, properly speaking, no brain at all, but only nerve ganglia, which correspond to the brain. In size, also, the brain of the lower animals, although sometimes (as in the elephant) actually greater, is always much less when compared with the size of the whole body, and it is found that the size of the brain proportionally to the size of the body is a direct measure of the intelligence of different animals. In man the brain weighs from 2 to 3 lbs., or about $\frac{1}{14}$ th of the weight of the body; in the dog the average weight is about $\frac{1}{14}$ th of the animal; in the horse $\frac{1}{14}$ th; and in the sheep $\frac{1}{14}$ th. Another difference between the brain of man and that of other vertebrate animals is, that in the latter the front part comes much further forward than it does in man. The brain attains its highest degree of development earlier than any other part of the body. In old age it loses both in bulk and in weight. As to its function, the brain is, generally speaking, the natural representative of the mind. All the intellectual faculties—thinking, volition, sensation—can be put in activity only by means of the organization of the brain. Nothing definite is known of the function of the separate parts of the brain. Nevertheless, from the earliest down to the latest periods, it has been attempted to find the seat of the mind in separate parts of the brain, and different parts have been arbitrarily fixed upon by different individuals. At the same time it is not to be denied that separate functions belong to certain parts of the brain, but all that has as yet been made out with regard to this is, that the parts of the brain lying in front have functions connected with the intellectual part of man's nature; while the parts lying nearer the back of the head belong more to our merely animal or organic nature. See PHRENOLOGY.

As the central organ of the nervous system the brain is sympathetically affected in nearly all cases of acute disease. The feeling of pain itself can arise only through the brain, and in cases of painless disease, when the parts attacked are furnished with nerves, the brain is nearly always affected and prevented from perfectly performing its functions, unless the affection is overcome by an exercise of will. Even delirium is in most cases only the consequence of other diseases. Among the diseases of the brain, properly so called, are those cases in which disturbances take place in the anatomical structure of the

brain, and also those in which the functions of the brain are seen to be disordered, although it may be impossible to point out any anatomical disturbance as the cause of this disorder of the functions. To the latter belong hypochondria, melancholia, mania, and other mental diseases. Epilepsy, hysteria, St. Vitus' dance, catalepsy, tetanus, hydrophobia, &c., may also be referred to the same class. To the other class of diseases, those in which its anatomical structure is disturbed, belong all cases of poverty or plethora of blood in the brain. With regard to these it is worthy of notice that both these causes, although opposite in themselves, may produce the same symptoms, giddiness, headache, &c. Inflammation of the membranes of the brain, accompanied by profuse perspiration, is a form of brain disease which is especially dangerous on account of the pressure it causes on the brain itself. This disease (meningitis) seldom occurs without the substance of the brain also being affected, in which case what is called phrenitis, or acute inflammation of the brain, ensues. Softening of the brain is sometimes the result of chronic inflammation of the brain, and in this case there is always a diminution of mental vigour as well as a loss of power over the body. Chronic inflammation is also apt to lead to the formation of abscesses on the brain, owing to the accumulation of pus. Defective nourishment of the brain is comparatively rare, and is usually the accompaniment of hydrocephalus from birth, being caused by the pressure of the water on the substance of the brain.

BRAINE-L'E-COMTE, a small and ancient town in Belgium, province of Hainaut, 34 miles s.w. Brussels; containing a handsome church, founded in the thirteenth century, and a large well-built chateau. The Southern Railway branches off from this town, on the w. side to Mons and Quilévrain, &c. to Namur and Charleroi. Amongst its public works are breweries, wire-works, dyeworks, oil, cotton, and corn mills. At one time it manufactured and dealt extensively in tin wares, but this branch of trade is almost if not entirely extinct. Pop. (1897), 8,499.

BRAINERD, DAVID, the celebrated missionary, was born in April, 1718, at Haddam, Connecticut. In the spring of 1742 he began the study of divinity, and at the end of July he was licensed to preach, for which a thorough examination had shown him qualified. He had for some time entertained a strong desire of preaching the gospel among the heathens which was gratified by an appointment as missionary to the Indians from the Society for Propagating Christian Knowledge. In 1744 he was ordained by a presbytery at Newark, New Jersey, and took up his habitation near the forks of the Delaware, in Pennsylvania, where he resided for a year, during the course of which he made two visits to the Indians on the Susquehanna River. His exertions, however, were attended with little success, until he went to the Indians at Crossweeksung, near Freehold, in New Jersey. Before the end of a year a complete reformation took place in the lives of the savages, seventy-eight of whom he baptized within that time. They became humble and devout; and it was not unusual for the whole congregation to shed tears and utter cries of sorrow and repentance. In 1747 he went to Northampton, in Massachusetts, where he passed the short residue of his life in the family of the celebrated Jonathan Edwards. He died in 1747 after great sufferings. He published an Account of the Rise and Progress of a Remarkable Work of Grace among a Number of Indians in New Jersey and Pennsylvania, 1746.

BRAKE. See RAILWAYS.

BRAKENBURG, REGENER, a well-known Dutch painter, distinguished for his rustic scenes, family

pieces, &c., was born at Haarlem, in 1649. His pictures are very carefully finished, and exhibit freshness and excellence of colouring, but the drawing is somewhat defective. He worked for a long time in Friesland, and died at Haarlem in 1702.

BRAMAH, JOSEPH, the inventor of the Bramah lock, the Bramah press, &c., born at Stainborough, in Yorkshire, in 1749; died in 1814. He was first apprenticed to a carpenter and joiner, but finally set himself up in business in London as manufacturer of various small articles in metal work. His future life was distinguished by a long series of ingenious inventions, many of which have been found of great utility. Besides those already mentioned, he was the inventor of the apparatus used in public-houses to bring liquids from the cellar to the counter, of a printing-machine which has been adopted by the Bank of England to number its notes; and he was also the improver of fire-engines, steam-engines, the manufacture of paper, &c.

BRAMAH SAFETY-LOCK, an ingeniously constructed lock, invented in 1784 by the English mechanician Bramah. The arrangement on which the security of the lock depends consists in a number of thin metal plates called alidors (generally six in number), the notches in which must simultaneously be brought into a certain position in order to render possible the movement of a bar which allows the lock to be shut or opened. This lock was called by the makers of it the 'impregnable,' and for some time it was thought that it could not be picked. The Messrs. Bramah, successors of the inventor, went the length of offering a reward of £200 to any one who should succeed in opening it in thirty days, without having seen the key. The challenge was accepted by an American, Mr. Hobbs, who won the reward by opening it in sixteen days, after fifty-one hours' labour, and this too without in the slightest degree injuring its delicate mechanism.

BRAMAH'S PRESS. See **HYDROSTATIC PRESS**. **BRAMANTE OF URBINO**, FRANCESCO LASEARI, shares with Brunelleschi the credit of being the restorer of architecture. He was born at Castel Duranti, in the duchy of Urbino, in 1444. He applied himself first to painting; but his passion for architecture soon gained the ascendancy. At length he went to Milan, and there his whole time was spent at the cathedral. Pope Alexander VI. named him his architect, and Julius II. made him superintendent of his buildings. At the command of the latter he united the Belvidere with the palace of the Vatican. He persuaded the pope to order the Church of St. Peter to be torn down, and another to be erected in its place, which should not have its equal in the world. In 1513 the foundation of this edifice was laid, according to the plan of Bramante. It yet remains the greatest production of modern architecture. Bramante died in 1514, without living to see this work completed. He had begun the edifice with incredible despatch; but his successors, Raphael, Julius of San Gallo, Peruzzi, and Michael Angelo, altered the original plan, and left nothing of Bramante's workmanship standing except the arches which support the tower of the dome. His writings, part prose part verse, first discovered in 1756, were printed the same year at Milan.

BRAMBLE (*Rubus fruticosus*), the name commonly applied to the bush with prickly stems which bears the well-known berries usually called in Scotland 'brambles,' and in England blackberries. The name is sometimes applied to the raspberry also, a plant very similar to the ordinary bramble, and belonging to the same genus. The bramble belongs to the natural order Rosaceæ, and the sub-order Potentillæ. It is rarely cultivated, but

it is one of the commonest plants which grow wild in hedgerows, and when it is cultivated its fruit is improved both in quantity and quality. The flowers of the bramble do not appear till late in the summer, and the fruit, which is deep purple or almost black in colour, does not ripen till autumn. A kind of wine, of very good flavour, is made in England from its berries.

BRAMPTON, a market town, England, county Cumberland. The town, 9 miles N.W. of Carlisle, is irregularly built, but is situated amid beautiful surroundings, amply supplied with water and gas, and generally improving. It contains a handsome octagonal market-house, two banks, a new church, and several other places of worship; and is now a favourite health resort. Pop. (1891), 2790.

BRAN, the husky part of wheat separated by the bolter from the flour. Its components are—water, 13; gluten, 19.5; fatty matter, 6; husk with starch, 55; and ashes, 7.5; but the results of different analyses vary considerably. It is employed in feeding cattle, more especially when it forms only one of the ingredients in the feeding-trough; for although it contains much nitrogen, it is not very nutritious. It has also been found useful as a manure, and mixed with warm water it is used by calico printers for removing colour adhering to the parts of the fabric which have not been mordanted.

BRANCHIOPODA, a division of crustaceans of the division Entomostraca. They are for the most part microscopic, and are chiefly distinguished by having the gills attached to the legs, which are generally numerous. The body is sometimes naked, but more frequently is enveloped by a buckler, which in some covers only the head and thorax, and in others the whole body. Some have two or even three eyes, but a greater number have one only. They are all free and continually in motion. Among the Branchiopoda are the water-fleas and brine-shrimps, and some also rank the trilobites among them.

BRANCHIOSTOMA, or **LANCELET**, also called *Amphioxus*, from its being sharp at both ends, a small fish about 2 inches long, of a very anomalous character, and forming a kind of link between the highest and some of the very lowest of animal forms. Though a vertebrate, it has no brain, and though a fish, it breathes like a mollusc, and has a circulation resembling that of an annelid. It was first discovered on the coast of Cornwall towards the latter part of the last century, and has since been taken in the Mediterranean and on the west coast of Scotland. Its remarkable configuration has attracted the attention of anatomists and physiologists, and it has been carefully studied.

BRAND is a provincial name for certain diseases of cereals, applied generically. Thus bunt is called *pepper-brand*, and smut is called *dust-brand*. The term is always applied in Germany to the disease commonly called *bunt* in this country, which word is most probably a corruption of *bunt* or *burnt ear*. The word has also been applied to the circular, brown, and apparently scorched spots which are so common on leaves, especially in greenhouses and in frames. It has been supposed that this arose from the concentration of the rays of light, by which the leaves were actually scorched; but this scarcely appears possible, especially when it is considered that the lanes of water thus formed on the leaves are plano-convex.

BRANDENBURG, a province of Prussia, surrounded mainly by Mecklenburg and the provinces of Pomerania, Posen, Silesia, and Prussian Saxony. The soil consists in many parts of barren sands, heaths, and moors; yet the province produces much grain, as well as fruits, hemp, flax, tobacco, &c., and supports many sheep. The forests are very exten-

sive. The principal streams are the Elbe, the Oder, the Havel, and the Spree; but the first two merely skirt the territory. Brandenburg carries on an active trade in manufactured articles, and is well situated for commerce, since it has many canals, rivers, good roads, and is intersected by the railways from Berlin to Leipzig, &c. The province of Brandenburg includes, besides some other districts, the greater part of the former Mark of Brandenburg, which formed the cradle of the Prussian monarchy, and the centre round which the present extensive kingdom has grown up. It is now divided into the two administrative divisions of Potsdam and Frankfurt (Berlin having been detached), and has an area of 15,376 square miles, with a pop. in 1900 of 3,108,009. Most of the inhabitants are Lutherans; the rest are chiefly Roman Catholics and Jews. From 1685 to 1688 many French refugees, Walloons, and inhabitants of Lorraine and of the Palatinate, settled in the Mark. At present Brandenburg is the most important of the Prussian provinces, including as it does the capital (Berlin), and the governments of Potsdam and Frankfurt. The first people who are known to have inhabited Brandenburg were the Suevi. They were succeeded by the Slavonians, a barbarous people, whom Henry I. conquered and converted to Christianity in the early part of the tenth century. The government was first conferred on a Saxon count, and did not become hereditary till the time of Albert, whose son succeeded to the dignity of elector in 1180. This race becoming extinct, Charles IV. assigned the electorate to his son Sigismund, who became emperor in 1415, and sold the region to Frederick, burgrave of Nürnberg, the ancestor of the present reigning family. Frederick William the Great made various accessions to the territories of his ancestors, and obliged the King of Poland, in 1666, to declare Prussia an independent state. The Old Mark was ceded to Napoleon in 1807, and formed part of the Kingdom of Westphalia; but it was restored to Prussia in 1814. The Elector of Brandenburg held the seventh rank among the electors of the empire, and had five votes in the council of princes.

BRANDENBURG, a Prussian town, on the Havel, 35 miles W. of Berlin, formerly the residence of the reigning family of Prussia. The Havel here forms a sort of lake, and divides Brandenburg into the Old Town, the New Town, and the Cathedral Island, the last containing a castle and the cathedral. The latter is a late Romanesque building (1170-1318), restored in the present century. The industries embrace woollen yarn, silk goods, baskets, leather, &c. Pop. in 1895, 42,690.

BRANDING, a form of punishment once in use for various crimes, but abolished by 3 Geo. IV. cap. 38. It was performed by means of a red-hot iron, and the part which was branded was the cheek, the hand, or some other part of the body. When the practice of arresting judgment in criminal cases by Benefit of Clergy was in force, it was customary to brand on the left thumb any layman who received this benefit, since it was not permitted to a layman to enjoy it more than once. Even after branding had been abolished in all other cases it was for a long time retained in the army as a punishment for desertion, the letter D being marked on the left side of a deserter 2 inches below the armpit. It was not, however, properly speaking, branded on his side, but marked with ink, gunpowder, or some other substance which would leave a stain that could not be obliterated without destroying the skin at the part. This also has been abolished.

BRANDIS, CHRISTIAN AUGUST, a distinguished German philologist and historian of ancient philosophy, born at Hildesheim in 1790; died at Bonn, July

24, 1867. After a course of philological and philosophical studies at Kiel and Göttingen, he entered upon his academical career at Copenhagen in 1812, where he graduated as Ph.D., and for a short time delivered lectures on philosophy. He then removed to Berlin, where he again established himself as lecturer on philosophy; but he had scarcely begun his course of lectures when he was induced by Niebuhr in 1816 to accompany him to Rome as secretary to the Prussian embassy. From 1819 to 1821 he was engaged in conjunction with Immanuel Bekker in collecting materials for a new edition of Aristotle, which was published in four vols. at Berlin (1831-36). In 1821 he was appointed ordinary professor of philosophy at Bonn, and his professional duties at this university were continued during the rest of his life, being only interrupted by a residence of three or four years in Greece, where he was acting as councillor to King Otho. After his return from Greece he published an interesting and instructive work, for which his residence in that country had furnished him with materials, entitled *Mittheilungen über Griechenland* (Communications on Greece), Leipzig, 1842, and at the same time resumed his professorship at Bonn. His two most important works are his *Handbuch der Geschichte der Griech.-Röm. Philosophie* (Handbook of the History of Greek and Roman Philosophy), Berlin, 1835-60; and *Geschichte der Entwicklungen der Griech. Philosophie* (History of the Developments of Greek Philosophy), Berlin, 1882-84.

BRANDON, an English market town, county of Suffolk, pleasantly situated on the Little Ouse or Brandon, over which is a neat stone bridge. Gunflints are still manufactured here for the African trade—a continuation of the flint implement industry which existed in prehistoric times. There are extensive rabbit-warrens in the neighbourhood, and the preparation of rabbit fur for hat-makers is the chief industry. The Duke of Hamilton and Brandon takes the latter title from this place. Pop. (1891), 2334.

BRANDT, GERHARD, a celebrated Arminian divine, born at Amsterdam in 1626. After completing his studies and making himself a thorough Hebrew and Greek scholar, he became pastor of the Remonstrants, first at Nieukoop and afterwards at Amsterdam, and died there in 1685. His works, almost all written in Dutch, include a *Life of Admiral Michel Ruyter*, which has been translated into French; a *Narrative of the Trial of Barneveldt, Hoogerbeets, and Grotius*; and a *History of the Reformation*. The last work, on which his fame chiefly rests, has been translated into English. It is remarkable for the elegance of its style, but is written too much in the spirit of partisanship.

BRANDT, NICHOLAS or SEBASTIAN, a German chemist of the seventeenth century, usually considered the discoverer of phosphorus. Leibnitz mentions him as a chemist of Hamburg, who, during a course of experiments on urine, for the purpose of discovering a solvent which would convert silver into gold, accidentally produced phosphorus, in 1667 or 1669. He communicated or sold his discovery to Kunkel, who showed it to Leibnitz. Boyle, having got a piece of the phosphorus, and knowing from what material it had been obtained, after various experiments succeeded in preparing it, and thus made an independent discovery of the method.

BRANDT, SEBASTIAN (named *Tizio*), born at Strasburg in 1458; died there in 1520. He studied law at Basel, took the degree of Doctor, and delivered lectures on this science for many years with great applause. He was still more distinguished for his poetical talents, and the Emperor Maximilian I. invited him several times to his court.

He has immortalised himself by a poem called the *Ship of Fools*, or the *Ship from the Land of Folly*, which satirizes the vices and follies of his age (and of other ages as well). It was first published at Basel, 4to, in 1494. Four editions appeared in one year. It was soon translated into Low German, Latin, and French, and by and by into all the languages of Europe. In Germany it was for long truly a national book, so esteemed that the celebrated preacher Gellier of Kaisersberg delivered public lectures upon it from the pulpit at Strasburg. The book is divided into a hundred and thirteen chapters, which, however, have no connection with each other. The descriptions are not in general poetic, but contain many happy and picturesque passages, and often display learning and vigour. There is a well-known English translation by Alexander Barclay, who, however, did more than the work of a mere translator, and gave the book an English colouring. See *BARCLAY (ALEXANDER)*.

BRANDY, the name most commonly applied to the spirit distilled from the juice of the grape, but also given to liquors distilled from other fruits, such as cherries, peaches, &c. All these brandies differ from each other only in the essential oil which they contain, and which gives to each its different flavour and aroma. The alcohol in brandy generally constitutes 50 per cent of the whole, the remaining substances being water, amy, propyl, and isobutyl alcohols, glycerol, &c. The aroma is due to cœnanthol ether and some volatile oils. When brandy is rectified by repeated distillation, the essential oil and the water it contains are given off, and it becomes pure alcohol. It is colourless at first, but usually derives a brownish colour from the casks in which it is kept; or as is often the case, it is coloured by means of burnt sugar or other colouring matters. The best brandy is that made in France, the white wines producing the finer kinds. It is produced chiefly in the departments of Charente, Charente-Inferieure, Landes, Gers, and Lot-et-Garonne, that of the two first-named, known as Cognac, being the finest. A large quantity of what is sold as brandy is not really brandy at all, but consists of whisky or other spirits flavoured and coloured to resemble the genuine article. Whisky, rum, potato spirit, and beet-root spirit are those that are generally used for this purpose, such brandies being made in France as well as in other countries, including Britain. Dantsig brandy is manufactured from rye and the root of *Calamus aromaticus*, Guernsey brandies from beet-root, and in North America a considerable quantity of cider brandy is made. Brandy is often taken medicinally, being used in cases of diarrhoea, and as a tonic and stimulant. By an act of parliament in 1877, 25% under proof is the weakest brandy allowed to be sold. The duty on it is at present 10s. 10d. the gallon; it was at one time as high as 22s. 10d. The quantity imported into the United Kingdom varies considerably in different years, say from about 2,500,000 gallons to 3,500,000.

BRANDYWINE CREEK, a small river which rises in the state of Pennsylvania, passes into the state of Delaware, and after a course of about 45 miles joins the Christiansa, 2 miles below Wilmington.—This river is noted for giving name to a battle fought near it, Sept. 11, 1777, between the British and Americans, in which the latter were defeated.

BRANK, or **BRANKS**, an instrument formerly in use in Scotland, and to some extent also in England, as a punishment for scolds. It consisted of an iron frame which went over the head of the offender like a common horse-bridle, and had in front an iron plate, which was inserted in the mouth, where it was fixed above the tongue and kept it perfectly quiet. Such instruments are still to be seen preserved in several

of the museums, municipal buildings, and churches of England and Scotland, among others in the Ashmolean Museum, Oxford, and the National Museum of Antiquities at Edinburgh.

BRANTÔME, PIERRE DE BOURDEILLE, LORD OF THE ABBEY OF, was born in Périgord, in Gascony, about 1540; died in 1614. In his epitaph, composed by himself, he relates in a vaunting manner how he first bore arms under the great Francis of Guise, and afterwards served the king, his master. At an early age he received the abbey of Brantôme, but his life was mostly spent in war and gallantry. After the death of Charles IX. he withdrew to his estates and wrote his memoirs, which have a great deal of vanity and self-complacency, mingled with much that is interesting. They are a living picture of his age; for Brantôme was personally acquainted with all the great characters of the time, and an eye-witness of all the important events which then took place, and in some was an actor. Brantôme's character was that of his native province and of his rank. He was a courtier, regardless of right or wrong; who does not blame the great, but observes and relates their faults and crimes as ingenuously as if he were uncertain whether they deserve praise or blame; as indifferent about honour and chastity in women as about integrity in men. He speaks of the good King Louis XI., who ordered his brother to be poisoned, and of the virtuous ladies whose adventures no pen but his own could describe. He places us in the middle of that century when expiring chivalry was contending with the forming, and as yet unsettled manners of later times. Brantôme, in the midst of his wandering life, had acquired more learning than most of his fellow soldiers. He has left *Vies des grands Capitaines Français*; *Vies des grands Capitaines Étrangers*; *Vies des Dames Illustres*, and *Vies des Dames Galantes* (together named by the author *Recueil des Dames*); besides other works. The first edition of his works was published at Leyden in 9 vols. in 1555-66; and in 1864-82 Ludovic Lalanne issued the most complete edition in 11 volumes.

BRASENÖSE, one of the colleges of Oxford University, founded by William Smith, bishop of Lincoln, and Sir Richard Sutton, in 1509. The origin of the name is unknown, farther than that it was transferred to the college from the previously existing Brasenose Hall. Sir Anthony Wood states that Brasenose Hall had as its sign a nose of brass, being probably a knocker. The college is very rich in endowments, which, however, have suffered owing to the decreased revenue from land. Brasenose has now twelve ordinary fellowships, besides supernumerary fellowships and the fellowship held by the Camden professor of ancient history. There are numerous scholarships and exhibitions. It has the patronage of some valuable church livings.

BRASIDAS, a Spartan general who distinguished himself in the first half of the Peloponnesian war by his courage and his military skill. After repelling the attack of the Athenians on the fortress of Methone (B.C. 431) he was elected by his fellow-countrymen to be the leader of an expedition intended for Thrace. The numerous colonies and allies of the Athenians in that part nearly all went over to the Spartans, after the arrival of Brasidas, and the former were obliged to despatch two armies to Thrace to oppose him. Cleon, the leader of the second army, allowed himself to be drawn into a battle at Amphipolis, and was totally defeated, he himself being in the number of the slain (B.C. 422). But the Spartan victory was purchased with the loss of the engagement.

BRASS. Copper and zinc unite in several pro-

portions, forming alloys of great importance in the arts. The best brass consists of two parts by weight of copper to one of zinc; and when the latter is in greater proportion, compounds are formed called *tombac*, *Dutch gold*, and *pinchbeck*. The advantages which lead to the extensive use of this alloy in the arts consists in its bright yellow colour, its hardness, and the facility with which it is cast. On the other hand, ordinary British brass, composed as stated above, is not malleable when hot, and therefore all articles made from it must either be cast or turned. In order to remove this disadvantage, an alloy has been made differing from the ordinary British brass, by having a larger proportion of zinc, which has the effect of producing a compound combining all the valuable qualities of brass with the property of being malleable when hot. The proportions in this case are about three parts of copper to two of zinc. Brass is sometimes mixed with about two per cent of lead to enable it to be used more readily for work that requires to be turned or filed. The lead has the effect of hardening the brass, so that the turnings break short, and the tool is thus prevented from being clogged. In order to resist the action of the air on brass, it has to be covered with a coating of metal that is not so easily oxidized. The process is first to bring the brass to a clean face by repeated immersions in nitric acid, and then to cover it with an alcoholic solution of shellac. Generally more or less dragon's blood is added to this solution in order to vary the tint of the brass according to pleasure. *Brass foil*, also called *Dutch leaf*, and in German *Rauschgold*, is made by beating out sheets of very thin brass containing a large proportion of copper. By this process leaves may be obtained not more than $\frac{1}{1000}$ th of an inch in thickness. In this country brass is manufactured on a large scale, chiefly at Bristol and Birmingham in England, and at Holywell in North Wales. Brass was well known to the Romans under the name of *orichalcum*, who took advantage of its resemblance to gold in robbing the temples and other public places of that precious metal. Thus Julius Cæsar robbed the Capitol of 3000 lbs. weight of gold, and Vitellius despoiled the temples of their gifts and ornaments, and replaced them with this inferior compound.

BRASSES, SEPULCHRAL or MONUMENTAL, large plates of brass inlaid in polished slabs of stone, and usually containing the figure of the person intended to be commemorated, either in a carved outline on the plate, or in the form of the plate itself. In England the latter mode of representing the figure was the more common, while the other mode was the prevailing one on the Continent. It was usual to add the coat of arms along with an inscription to the figure which occupied the main portion of the brass, and where the brass was cut out so as to represent by its outline the figure of the person commemorated, these additions were made on separate pieces of brass, fixed in the same slab of stone. Sometimes the figure was entirely wanting, and its place taken by an ornamented cross. It is not known how old the practice of laying down such monumental slabs is. The earliest that has come down to us is one at Stoke d'Abernon, in Surrey, which commemorates Sir John d'Abernon, who died in 1277; and the earliest on record is that of Simon de Beauchamp, who died at the beginning of the same century. Large numbers of these brasses were no doubt destroyed, along with many other monuments of ecclesiastical art, at the time of the Reformation, as well as during the wars of the Long Parliament; but those which have come down to us are of immense value in giving us an exact picture of the costume of the time to which they belong.

BRASSICA, a very important genus of cruciferous plants, including among its numerous species many of great economical value, as the cabbage, turnip, rape, &c. Owing to the numerous crossed races which have been produced in modern times, the limits of the species have been broken down, and often cannot easily be recognized.

BRAUN, AUGUST ERN., a German archaeologist and writer on art, born at Gotha, August 19, 1809; died Sept. 12, 1856. He received his early education at his native town, and continued his studies at Göttingen. From 1832 to 1833 he resided at Dresden, whence he went to Rome in company with Gerhard, with whom he had formed a close intimacy. In the same year he was appointed first librarian and then assistant-secretary to the Archaeological Institute, and in 1834 became editor of the *Bulletino*, and in 1837 of the *Annali* of that institution. His chief works are: *Il Giudizio di Paride* (The Judgment of Paris), 2d ed. Par. 1838; *Die Kunstvorstellungen des Gefüßgötzen Ikonos* (The Artistic Representations of the Winged Bacchus), Munich, 1839; *Antike Marmorwerke* (Ancient Works in Marble), 1st and 2d decades, Leipzig, 1843; *Griech. Gotterlehre* (The Greek Doctrine of the Gods), Gotha, 1850-54; *Die Vorschule der Kunstmythologie* (The School of Art Mythology), Gotha, 1854, with 100 copperplate engravings, translated into English by Mr. Grant (Gotha, 1856); *Die Ruinen und Museen Roms* (The Ruins and Museums of Rome), Bruns. 1854, constituting an excellent guide-book for artists and antiquaries.

BRAUNSBURG, a town, Prussia, province of Eastern Prussia, and government of Königsberg, on the Passarge, about 4 miles from its junction with the Frische Haß, divided by the river into the old and new towns. It is the residence of the Bishop of Ermeland, and the seat of a royal court of justice; contains four Roman Catholic churches and one Protestant church; a Roman Catholic Lyceum, with theological and philosophical faculties; a gymnasium, and seminary for priests, with six professors; a normal school, an asylum, and three hospitals. It has some linen and woollen manufactures, and tanneries; and a considerable trade in yarns, grain, and ship-timber, the river being navigable for small vessels as far as the town. Pop. in 1895, 11,856.

BRAUWER, ADRIAN. See **BROUWER**.

BRAVI, the name formerly given in Italy, and particularly in Venice, to those who were ready to hire themselves out to perform any desperate undertaking. The word had the same signification in Spain, and both the word and the persons designated by it were found in France in the reign of Louis XIII. and during the minority of Louis XIV. At the end of the fifteenth century they are described as being armed to the teeth, with an arquebuse in their hands, a cutlass at their side, masked by a bushy beard and enormous moustaches, and wearing a long and thick forelock called a *ciuffo*, which they used to bang down over their face when they wished to conceal it entirely. The Bravo is the title of a Venetian story which is one of the best works of the American novelist J. Fenimore Cooper.

BRAVURA AIR, an air so composed as to enable the singer to show his skill in execution by the addition of embellishments, striking cadences, &c. It is sometimes used for the style of execution.

BRAXY, or **DYSENTERY** IN SHEEP, inflammation of the coats of the intestines. It is often preceded by diarrhoea, and attended by fever and constitutional disturbance. A sudden change of pasture, more particularly from a succulent to a high and dry pasture, is one of the most frequent causes, and to this may be added exposure to wet and cold after travel.

Eng. It is a much more serious disease than simple diarrhoea, and often becomes fatal in the course of a few days. The name is also applied to a blood disease resulting from plethora, which is considered by some to be the true braxy. In this case also a sudden change of pasture is the most frequent cause of the disease, but the change which generally produces it is the reverse of that which produces the former, namely, a change from a low diet to rich and nourishing food. This disease is even more fatal than the former, and runs its course in a few hours. As there is no means of saving an animal which is once attacked, the only course is to avoid the causes which lead to the disease.

BRAY, a maritime town, Ireland, partly in co. Dublin and partly in Wicklow, picturesquely situated on both banks of the Bray, which here forms the boundaries of these two counties, 12 miles S.E. of Dublin. The town, which has been popularly designated 'the Irish Brighton,' has been much improved in recent years, new houses being built, and a broad esplanade formed. Pop. in 1881, 6536; in 1891, 6888.

BRAY, SIR REGINALD, second son of Sir Richard Bray, one of Henry VI.'s privy-councillors, devoted himself to architecture, and stood high in the favour of Henry VII., for whom he is understood to have designed, if he did not actually execute, the beautiful chapel at Westminster which bears that monarch's name. Another of his works, and now his final resting-place, is the almost equally beautiful chapel of St. George's at Windsor. He died in 1503.

BRAZIL, now called officially the UNITED STATES OF BRAZIL, a vast republic in South America, occupying a space nearly equal to one-half of that entire continent. It is of extremely irregular outline and varying dimensions; its greatest diameter being, E. to W., or from Cape Augustin (lat. 8° 21' S.; lon. 84° 56' W.) to the river Yavari or Jabary, which separates it from Peru, 2630 miles; and, N. to S., from Cape Orange (lat. 4° 23' N.; lon. 51° 25' W.), E. of Oyapok Bay, to the southern extremity of Lake Mirim, 2580 miles; area roughly estimated at 3,120,000 square miles. It is bounded S.E., E., and N.E. by the Atlantic Ocean; N. by French, Dutch, and English Guiana, and Venezuela; and W. and S.W. by Colombia, Peru, Bolivia, Paraguay, and the Argentine province of Misiones, and by the republic of Uruguay. Its entire coast-line, from the extreme southern point already mentioned, to the head of the Bay of Oyapok (lat. 4° 0' N.; lon. 51° 32' W.), is upwards of 3700 miles. Throughout this vast extent of coast there are few great indentations, though in some parts smaller harbours and inlets are pretty numerous, many of the former excellent and generally surrounded by flats. The principal bays, reckoning from the S. extremity of the country, are, Santos, Rio Janeiro, Bahia or All Saints, on the S.E. coast; and St. Marcos, St. Jose, Pinzon, and Oyapok on the N. and N.W. coasts. The principal capes or headlands are, Capes Frio, St. Thome, Point St. Antonio, St. Augustin, St. Roque, on the S.E. and E. coasts; and Maguary, Norte, and Orange, on the N. coast.

General Description.—The appearance of the coast of Brazil is very different at different places. From the S. extremity to the island of Santa Catharina, a distance of about 450 miles, it is low, sandy, and intersected by the outlets of numerous lakes or lagoons, which skirt the shores throughout this whole extent. From this point, or from about lat. 27° 30' S. to lat. 21° 45' S., 700 miles, the land is very elevated, appearing rugged and mountainous from a distance, but when more nearly approached becoming highly picturesque; its hills being clothed with thick woods, and its valleys with a never-fading verdure. This part of the coast, the most rocky

portion of which is between Santos and Cape Frio, may be seen from the sea at a distance of 55 miles. From lat. 21° 45' S., or from about St. Joao to Bahia, lat. 13° S., 650 miles, the coast is in general low and level, with hardly any indentations. From Bahia to about lat. 4° N., which embraces the whole E. projection of Brazil, the coast (about 800 miles in extent) is of moderate height, nowhere rising above 30 feet, and is also destitute of harbours, excepting those formed by the mouths of rivers. From this point to the Amazon it is extremely low and marshy; W. and N. of that river it is sandy, and somewhat higher, though still of inconsiderable elevation. From these details it will be seen that the only portion of the coast of Brazil that can be called mountainous, or which has any pretension to picturesque appearance, is that between the island of Santa Catharina, lat. 27° 35' S., and St. Joao da Praia, lat. 21° 40' S., or about a fifth part of the whole. With the exception of the Rio Francisco and the Paraná, all the large rivers of Brazil empty themselves on its N. shores, and nearly all run parallel courses from S. to N., traversing the vast plains which occupy the centre and N.W. portions of the empire, and presenting means of internal communication unequalled in any other part of the globe. The surface of Brazil generally is divided into upland and lowland in pretty equal portions; the former, which comprises the hilly districts and table-lands, extends over the E., S., and central parts, and has an average elevation of about 2000 to 2500 feet, although at some points it reaches from 4000 to 10,000 feet, such elevations generally forming the culminating points of continuous mountain chains, which stretch for the most part from N. to S., as in the Serra do Mar and in the Serra dos Orgãos, though occasionally we find very lofty summits situated in comparatively isolated positions. The lowlands comprise the *silvas* or woody regions, and the *lanos* or plains and flats; the former lying principally along both sides of the Amazon, and the latter stretching chiefly along the N. and N.E. shores.

Brazil is divided, politically, into 21 states (formerly provinces), of which there are at least nine each exceeding Great Britain in superficial extent. It is, however, very difficult to ascertain accurately the area of the states, and of the whole country, the existing data being very unsatisfactory and conflicting. In the following table the areas are the result of planimetric calculation (but the boundaries of Brazil are somewhat uncertain); the population is that given by the census of 1890:—

States.	Area in sq. miles.	Population.
Amazonas.....	732,460	147,915
Pará.....	443,858	287,191
Maranhão.....	177,596	420,354
Piauí.....	116,218	287,609
Ceará.....	40,233	805,287
Rio Grande do Norte.....	22,195	262,773
Parahyba.....	23,854	457,232
Pernambuco.....	49,625	1,080,324
Alagoas.....	25,558	311,440
Sergipe.....	7,370	310,625
Bahia.....	164,649	1,819,800
Espirito-Santo.....	17,312	135,997
Rio de Janeiro.....	26,084	976,584
S. Paulo.....	112,880	1,384,753
Paraná.....	86,463	249,491
Santa Catharina.....	27,438	223,769
Rio Grande do Sul.....	91,835	997,455
Minas Geraes.....	222,190	2,184,000
Goyaz.....	238,546	227,573
Matto Grosso.....	535,708	92,327
Federal District.....	538	583,561
	3,309,878	14,332,580

In addition to the population given above, it is estimated that there are perhaps 600,000 uncivilized Indians. The most important towns in Brazil are the capital Rio de Janeiro, Bahia, Pernambuco, Pará or Belem, San Paulo, Parahyba, Ceará, and Porto Alegre.

Mountains, Table-lands, and Plains.—In remarkable contrast to the countries on the w. side of the South American continent, Brazil has no mountains of very great elevation. The higher mountains of Brazil, most of them occurring at greater and lesser distances from the e. coast, extend generally in a direction more or less from s. to n., although numerous inferior ranges traverse the country in various other directions. The most connected chains, and those in which the highest summits occur, are the Serra do Kapinango, the Serra dos Orgãos, and the Serra do Mar. The first originates in Bahia, about lat. 15° s., and, intersecting the state of Minas Geraes, terminates at lat. 28° s. It lies parallel to the coast, and at a distance from it of about 260 miles; its culminating point, believed to be the highest in Brazil, is Itatiaia-Açu, 10,040 feet. The Serra dos Orgãos (Organ Mountains), so called from the fancied resemblance of its peaks to the tubes of an organ, and the Serra do Mar, which form, in fact, but one chain, the first name being applied to the n.e. half of the range, and the second to the s.w., lie also parallel to the coast, n.e. and s.s.w., but at a distance from it of a very few miles only, extending from about lat. 22° to 27° s. The culminating points of this range appear to occur in the Serra dos Orgãos division, which has summits rising to the height of 7000 or 8000 feet. Elevated regions also extend n. and w. from these mountain-systems through the states of Minas Geraes, Pernambuco, Goyaz, and Matto Grosso, but few of the peaks here appear to attain any very great elevation. Between the sources of the Tocantins and Paraná, however, are the Montes Pyreneos or Pyrenes, in which are summits estimated at 8000 and 10,000 feet. Towards the Paraguay the hills become lower, and on the Bolivian frontier there are marshes. The water-shed between the affluents of the Amazon and La Plata is so little elevated that some of the sources of the Madeira, which falls into the former, and of the Paraguay, which enters the latter, are not more than 3 miles apart, and might easily be joined by a canal. The hilly region or table-land extends along the e. side of the country as far n. as lat. 3° s., but inland, in Matto Grosso, not farther than 12° s., and n. of lat. 10° s., the Serra Ibiapaba may be taken as the w. limit. This table-land occupies half the country, together with part of the Argentine Republic and Uruguay, and its average elevation is from 2000 to 2600 feet. Along the Amazon and its affluents the vast plains or *silvas* are said to occupy a space equal to six times the size of France. Another great plain stretches between the Serra Ibiapaba and the river Tocantins, measuring from n. to s. upwards of 600 miles, and from e. to w. more than 400.

Rivers and Lakes.—The river system of Brazil is unequalled, perhaps, in any other part of the world for the number and magnitude of the streams of which it is composed, the surface of the whole n.w. portion being interlaced with rivers of every length and volume; presenting the complex appearance of vessels in the human body, to which the Amazon and its larger tributaries may be said to stand in the relation of main arteries. By far the greater portion of these numberless streams have more or less of a northerly direction, and finally find their way, either directly or through their principals, to the Amazon. The largest river of Brazil, and the largest, it is believed, in the world, though not the longest, is the Amazon, which

enters the country from the w., about lat. 4° 30' s.; lon. 70° w., and after a n.e. course from the point named of about 800 miles, falls into the Atlantic near the equator. In order of magnitude follow the Rio Negro and Madeira, both tributaries of the Amazon; the former flowing from the n.w., the latter from the a.w. The other large rivers in this portion of the country are the Branco, a tributary of the Rio Negro; the Tapajós and Xingu, other two large tributaries of the Amazon; the Araguay, Tocantins, Maranhão, and Parahyba. The next in size is the Rio Francisco, which, after flowing n. for about 800 miles, suddenly turns due e., and subsequently s.e., falling into the sea about lat. 11° s. Passing along the coast, s. from the embouchure of the Francisco, the following considerable rivers occur—the Vazabarra, Itapicuru, Paraguassu, Belmonte or Jequitinhonha, in the state of Bahia; Doce, state of Espírito-Santo; and the Paraíba-do-Sul, the s. boundary of the same state. In this enumeration of the rivers having their embouchures on the e. coast of Brazil, we have omitted an immense number of smaller streams, perhaps not many below a hundred. In the interior of the s. portion of the country occur the large rivers Uruguay, Yguazú, Paranápanema, Tieta, Para, Paraguay, and Paraná, with numerous smaller streams—smaller in comparison to these, but still large rivers—winding in all directions through every province. Most of the rivers in this part of Brazil have a w. and s. direction; those having the former proceeding from the w. side of the *serras* by which this part of the coast is lined, and those having the latter issuing from the hilly tract which crosses the centre of the state of Matto Grosso from e. to w., and which forms the water-shed of the w. and central part of the country, the rivers of the province of Para flowing from it n., and those of Matto Grosso s. and w. Of the rivers last named, the Paraguay and Paraná are the largest, and have the longest courses. The former has its sources in the central high lands of Matto Grosso, whence it flows nearly due s., quitting the Brazilian territory at lat. 21° s., and from this point forming the w. boundary of the independent state of Paraguay. The Paraná rises in the hilly district of the state of Goyaz, not far from the sources of the Tocantins, although their subsequent courses are nearly in direct opposition; the latter proceeding due n., while the former flows s.s.w. The Paraná forms, throughout a portion of its course, the boundary between the Brazilian territory and Paraguay, quitting the former about lat. 25° 40' s. Although unrivalled in the number and magnitude of its rivers, Brazil has comparatively few lakes of any great extent. The largest is the Lagoa dos Patos, a lagoon ~~in the~~ state of Rio Grande do Sul, the most southern of the Brazilian states; it is about 150 miles in length, and 35 miles in breadth at the widest part, and is separated from the sea by a narrow strip of land only; it discharges its water into the ocean by a channel called the Rio Grande. Further n. several smaller lakes occur, the largest of which may be from 20 to 30 miles in length. There are hardly any others worth mentioning throughout the whole of Brazil.

Geology and Mineralogy.—Granite prevails to the extent of 2000 miles along the coast of Brazil, and, with syenite, forms the base of the table-land. The superstructure of the latter consists of metamorphic and old igneous rocks, sandstone, clay-slate, limestone, in which are large caverns with bones of extinct animals, and alluvial soil, of which the s. part of the country is almost wholly composed, being intersected by numerous large streams. The mineral wealth of Brazil is considerable, and includes gold, silver, and iron, diamonds, topazes, and other pre-

clous stones. Amongst the earliest discovered and first wrought gold-mines were those of Jaraguá, but they have long ceased to be regularly worked, the precious metal being found more easily and in greater abundance mingled with the sands and alluvial deposits of rivers. The process of separation, the gold being in small particles, is effected by repeated washings, which are continued until nothing but the pure metal remains at the bottom of the vessel. The entire quantity of gold produced has now greatly fallen off, being hardly a fourth of what it formerly was, owing chiefly to the auriferous sand having been exhausted. Large quantities of diamonds have been obtained in Brazil. The district from which most stones have been derived is Diamantina in Minas Geraes, adjoining the Serra do Espinhaço. The diamonds have been hitherto found in the beds of rivers only, and are washed from the sand and stones with which they are mingled much in the same way as the gold. The largest known Brazilian diamond was found in the Rio Abasté in 1791, and weighs 188½ carats. The negro who found a diamond weighing 17 carats used to obtain his liberty, a variety of proportionate rewards being appointed for those of lesser value. About 20,000 negroes were at one time employed in the diamond mines. The government received one-fifth of the total value of all the gold and diamonds found in the country. Notwithstanding the sounding names of these two items of the mineral wealth of Brazil, neither of them has been nearly so profitable, nor so beneficial to the general interests of the country as the home-liest of its agricultural productions. In the short space of a year and a half the exports of sugar and coffee amounted to more than the value of diamonds found throughout a period of eighty years.

Climate.—As almost the whole of Brazil lies south of the Equator, and in a hemisphere where there is a greater proportion of sea than land, its climate is generally more cool and moist than that of countries in corresponding latitudes in the northern hemisphere. This is particularly applicable to the flat portions of the country, where impenetrable forests occupy the alluvial plains, and, by preventing the sun's rays reaching the earth, cut off one of the principal sources of heat—radiation. In the southern parts of Brazil, in consequence of the gradual narrowing of the continent, the climate is of an insular character—cool summers and mild winters. The quantity of rain that falls in Brazil differs widely in the amount in different localities. The northern provinces generally are subject to heavy rains and violent storms; but the southern regions rejoice in a settled, mild, and salubrious climate. The rainy season commences in October, and usually lasts till March, setting in with heavy thunder-storms. At Rio, where the climate has been much modified by the clearing away of the forests in the neighbourhood, the mean temperature of the year is 72°; and the rains have been so diminished as to have seriously reduced the supply of water to the city. Generally the climate of Brazil is delightful, diffusing and maintaining a perpetual summer throughout this favoured land. In the northern parts the air in the lower tracts is somewhat sultry and oppressive; but vegetation is vigorous and profuse, the ground being covered with flowers, and the trees with a foliage that is ever green; while the nights are deliciously cool. Near the coast the temperature is modified by the trade-wind, which, after traversing the Atlantic, fans the shores of Brazil, imparting a refreshing coolness to the atmosphere.

Soil, Vegetable Productions, &c.—The soil of Brazil, so far as its capabilities have been tested, is highly fertile. Altogether but a comparatively small por-

tion has yet been subjected to this test, probably not more than a hundredth part of the surface being under cultivation, and this portion is almost entirely limited to the coast, and to the s.e. part of the country, which seems peculiarly well adapted for the cultivation of maize, sugar, and coffee. The pastures, moreover, are of vast extent, and, as they afford food for immense numbers of horned cattle, they form one of the principal sources of the wealth of the country. Being almost wholly within the limit of the palm region, the vegetation of Brazil is characterized generally by the peculiar physiognomy which that beautiful family of vegetables impresses on tropical countries. Of these nearly 200 species are known as native to the country. The chief food-supplying plants are sugar, coffee, cacao, rice, maize, wheat, manioc (cassava), beans, bananas, yams, lemons, oranges, figs, &c.—the two first, sugar and coffee, being the staple products of the republic. The manioc is a native of Brazil, and its farina is almost the only kind of meal used in that country. An acre of manioc is said to yield as much nutriment as six acres of wheat. The Indians find in this beautiful and useful plant a compensation for the rice and other cereals of the Old World. But it is in the boundless forests of Brazil that the vigour of the vegetative power is exhibited in its most imposing form. No language, it has been said, can describe the glory of the Brazilian forests—the endless variety of form, the contrast of colour and size, the largest trees bearing brilliant blossoms of every hue, and clothed with a drapery of curious epiphytes and festoons of climbing plants, while thousands of a diameter of not less than 8 and 12 feet stand so close together that it is impossible (the intervals being filled up with an undergrowth of plants) to clear a passage between them. In contrast to these giants of the forest stand the graceful palm, the delicate acacia and bamboo, and grasses of 40 feet high. 'If the name of primeval forest,' says Humboldt, 'can be given to any forest on the face of the earth, none can claim it perhaps so strictly as those that fill the connected basins of the Orinoco and the Amazon.' But it is not in the plains alone that this gigantic vegetation is met with; the sides of the mountains are also clothed with trees of enormous size, including the most beautiful specimens of the palm and tree-fern. The cocoa-nut palm attains a great size on the sea-shores; and the curious *Bertholletia*, or monkey-pot tree, the kernels of which are exported from Para under the name of Brazil-nuts, is met with in many localities, but more especially in the north-western parts of the empire. A peculiar characteristic in Brazilian vegetation is the many species of the myrtle family, which, though not of much use economically, perfume the air with their exhalations. Rubber, drugs, dyes, fibres, vegetable ivory, and cabinet woods are all products of the Brazilian forests. Among the trees are the *andaquá*, or *Purga da Paulista* (*Anda Gomerii*), the seeds of which yield a purgative oil; the cacao or chocolate-tree; the *Cesalpinia echinata* or Brazil-wood tree, used, under the name of Pernambuco wood, for dyeing silk of a crimson colour; the rosewood tree, the fustic, mahogany, and a variety of others well adapted for various purposes. The different kinds of forests and woods in Brazil are distinguished by the inhabitants by particular names. There are the *Mattas*, or virgin forests, such as those which exist on the Organ Mountains and along the whole maritime cordillera; the *Catingas*, consisting generally of small and deciduous trees; the *Carrascos*, of close-growing shrubs, about 8 or 4 feet high; and the *Capveira*, such wooded tracts as are formed by the small trees and shrubs which spring up where virgin forests have been cleared away. The beauty, variety,

and abundance of the flowers of this extraordinary country are no less remarkable than any other of its vegetable productions. 'The whole country,' says Mr. Gardner, 'through which we had passed for nearly two days was one vast flower-garden, where, "like a child at a feast," I knew not which object to grasp at first; everything was not only new to me, but each more beautiful or more curious than the other.'

Animals.—The principal domestic animals of Brazil are horned cattle and horses; the numbers of the former are prodigious, covering the boundless plains of the interior. The greatest part of them live in a wild or semi-wild state. Horses are numerous in the s. provinces; they are of a middling size, from 12 to 14 hands high, but strong, lively, and swift. mules are reared in the southern provinces. Sheep are in little repute, the meat being ill flavoured and the wool of indifferent quality. Goats and hogs are abundant. The woods of Brazil swarm with wild animals, including the puma, jaguar, sloth, armadillo, &c. Wild hogs are also common, as well as an amphibious animal called the water-hog or capybara, resembling a hog in form, but of the size of a huffer. Monkeys are likewise numerous; and vampire bats are in some localities so destructive as to prevent the rearing of cattle. Amongst the feathered tribes are, the smallest, the humming-bird, and one of the largest, the rhea or ostrich. There are also parrots in great variety, and a powerful eagle, the harpy. Water-fowl, especially geese and ducks, abound in certain seasons on the lakes and lagoons at the s. extremity of Brazil. The reptiles consist of the boa-constrictor and other species of serpents, some of them venomous, especially the jararaca, which is much dreaded by the natives. When full grown it is usually about 6 feet long, and is nearly allied to the rattlesnake genus. It prevails over all the southern provinces. Its bite is attended with great suffering, and with the most serious consequences, even where death is averted. In the marshy countries of the south the boa or python is said to attain a length of over 20 feet. Other important reptiles are several species of alligator and different kinds of turtle, which, on the Amazon in particular, supply abundance of food. The insects of Brazil are, many of them, remarkable for the beauty of their colours and their size, especially the butterflies and moths, of which as many as 14,000 species are known. In some localities insects are so numerous in the woods that their noise is heard in a ship at anchor some distance from the shore. The white ants are especially numerous and destructive. The scorpions of Brazil attain a length of 6 inches. Most of the bees of the country are stingless, there being no fewer than thirty species of that description. The shores and rivers abound with fish. Amongst the most valuable of those caught on the former is the garopa, which attains a length of from 12 to 20 feet, and is well tasted; they are most numerous on the coast of Bahia, where great quantities are annually taken and exported. The numbers of fish caught in the Amazon and other rivers of the country are very great, constituting a principal part of the subsistence of the inhabitants.

Education.—In every town schools for teaching the first rudiments are now to be found, to which the children of all citizens are admitted free. There are no universities, but there are government colleges of law, medicine, &c. In all large towns there are professorships of Latin, Greek, English, French, philosophy, rhetoric, geometry, chemistry, botany, &c.; and printing-presses are now common throughout Brazil.

People.—The varied population of Brazil consists of

people of pure Portuguese blood, who form a comparatively small minority of the whole; of full-blooded negroes, who form the largest unmixed element in the population; of aborigines or native Indians; and of people of mixed race, the most numerous of all; besides a certain number of German and other European immigrants. The Portuguese portion of the population have made Portuguese the national language of the country. The native Brazilians of Portuguese blood are said to be an idle and inactive race, with few wants, and fewer enjoyments. The mulattoes, the offspring of Europeans and negroes, are ingenious, and evince an aptitude for the mechanical arts. The native Indians are generally of a copper colour, robust, and well made, but of short stature. They generally go naked, paint their skins, and are fond of ornamenting their heads with feathers. They belong to various tribes or races, among which the chief are the Tupi, the Guarani, and the Omagua. A certain number of them are nominally Christians.

Commerce.—The principal articles of import are cottons, linens, woollens, wrought and unwrought iron, coals, machinery, hardware, and cutlery from Britain, cottons, trinkets, furniture, candles, hats, fruits, and wine from France; glass, beer, linen, paper, &c., from Germany; iron, sailcloth, cord, rope, &c., from Russia and Sweden; wine, brandy, fruits, &c., from Portugal; and wheat, flour, biscuits, soap, leather, &c., from N. America. The exports consist of coffee, sugar, rubber, cotton, hides, cabinet and dye woods, drugs, gums, and diamonds. By far the most valuable export is coffee, which makes up two-thirds or more of the whole exports. These in 1897 were valued at £26,752,000, the imports being about £21,568,000. The imports from Great Britain (chiefly cottons, machinery and metals, woollens, coals) amounted in 1894 to £7,826,566, but in 1898 these had decreased to £6,196,288. In 1898 the exports to Britain were £4,601,775. The chief exports to Britain are caoutchouc (£3,608,198 in 1898), coffee (£516,240 in 1898, £190,278 in 1897), cotton (£1,179,648 in 1893, only £97,892 in 1898), raw sugar, cocoa, and fruits. In 1897 the railways of Brazil had a total length of nearly 9000 miles. At the same date the length of telegraph lines was over 10,000 miles. The number of letters and postcards sent through the post-office is over 33,000,000.

Religion, Government, &c.—There is now no established religion in Brazil, but the Roman Catholic is the one almost exclusively prevalent. Until recently the government was monarchical, hereditary, constitutional, and representative. Since the overthrow of the empire in 1889 republican institutions have been established, each of the old provinces being now a state, whose internal affairs are administered without interference from the central federal government. At the head of affairs is a president, by whom, and the national congress, legislation is carried on. The congress consists of a chamber of deputies and a senate, the former elected by direct vote as representative of the different states; while the senators are chosen by the state legislatures, three for each state for nine years. The executive authority is vested in the president. The public debt is now about £115,000,000.

The annual revenue of the republic has latterly amounted to about £10,000,000, and has been generally exceeded by the expenditure. The army numbers over 28,000 men, including officers; there are also about 20,000 gendarmes. Service is obligatory, the period being 3 years in the active army and 3 in the reserve. The effective navy is of moderate strength, but constitutes a considerable burden on the finances of the country.

History.—Brazil was discovered January 26, 1500, by Vincente Yanes Pinçon, one of the companions of Columbus, and was subsequently taken possession of by Pedro Álvares de Cabral. Emanuel, king of Portugal, had equipped a squadron for a voyage to the East Indies, under the command of Cabral. The admiral, quitting Lisbon, March 9, 1500, fell in accidentally, April 24th, with the continent of South America, which he at first supposed to be a large island on the coast of Africa. In this conjecture he was soon undeceived, when the natives came in sight. Having discovered a good harbour, he anchored his vessels, and called the bay *Puerto Seguro*. On the next day he landed with a body of troops, and having erected the cross, took possession of the country in the name of his sovereign, and called it *Terra da Vera Cruz*; but the name was afterwards altered by King Emanuel to that of *Brazil*, from the red wood which the country produces.

The Portuguese entertained, for some time, no very favourable opinion of the country, not having been able to find there either gold or silver; and, accordingly, they sent thither none but convicts and women of abandoned character. Two ships were annually sent from Portugal, to carry to the new world the refuse of the human race, and to receive from thence cargoes of parrots and dye-woods. Ginger was afterwards added, but in a short time prohibited, lest the cultivation of it might interfere with the sale of the same article from India. In 1548 the Jews of Portugal, being banished to Brazil, procured sugar-canes from Madeira, and began the cultivation of that article. The court of Lisbon began to perceive that a colony might be beneficial without producing gold or silver, and sent over a governor to regulate and superintend it. This was Thomas de Souza, a wise and able man. De Souza found it very difficult to succeed in inducing the natives to fix on settled habitations, and to submit to the Portuguese government. Dissatisfaction ensued, which at length terminated in war. De Souza did not bring with him a sufficient number of men to conclude hostilities speedily. By building St. Salvador, in 1549, at the bay of All Saints, he established a central and rallying point for the colony; but the great object of reducing the Indians to submission was effected by the Jesuits, who gained their affections by presents and acts of kindness.

The increasing prosperity of Brazil, which became visible to Europe at the beginning of the seventeenth century, excited the envy of the French, Spaniards, and Dutch successively. The latter, however, were the principal enemies with whom the Portuguese had to contend for the dominion of Brazil. Their admiral, Wilkens, in 1624, took possession of San Salvador (Bahia) in the name of the United Provinces. Having plundered the people of St. Salvador, he returned to Europe, leaving a strong garrison. The Spaniards next sent out a formidable fleet, laid siege to St. Salvador, and compelled the Dutch to surrender. When the affairs of the Dutch assumed a more favourable aspect at home, they despatched Admiral Henry Lonk, in the beginning of 1630, to attempt the entire conquest of Brazil. He succeeded in reducing Pernambuco, and on his return to Europe left behind him troops, which reduced, in 1633, 1634, and 1635, various other portions of the country. These, under Dutch management, furnished yearly a large quantity of sugar, a great deal of wood for dyeing, and other commodities. The Dutch now determined to conquer all Brazil, and intrusted Maurice of Nassau with the direction of the enterprise. This distinguished officer reached the place of his destination in the beginning of 1637, and subjected Ceará, Sergipe, and the greater part of Bahia.

Seven of the fifteen provinces which composed the colony had already submitted to them, when they were suddenly checked by the revolution which removed Philip IV. from the throne of Portugal, and gave to the Portuguese independence and a native sovereign. The Dutch, as enemies of the Spaniards, became friends to the Portuguese, and the latter confirmed the title of the Dutch to the seven provinces of which they were in possession. This division gave rise to the name of the *Brasils*, in place of the former appellation. The Dutch government soon began to oppress the Portuguese colonists, who, after an obstinate contest, drove them out of several of the provinces. Finding they were not able to retain possession of the country, the Dutch ceded all their interest to the Portuguese for a pecuniary compensation. The dominion of Portugal was now extended over all Brazil, which, during the eighteenth century, remained in the peaceful possession of the Portuguese.

The value of Brazil to Portugal continued steadily to increase after the discovery of the gold mines in 1698, and the discovery of the diamond mines in 1728. Up to the year 1810 Brazil had sent to Portugal 14,280 cwts. of gold and 2100 lbs. of diamonds, which foreign countries, and especially Great Britain, at last succeeded in purchasing at the Lisbon market. Rio Janeiro now became the mart for the proceeds of the Brazilian mines and native productions. But the administration was anything but adapted to promote the prosperity of the country. The attention of the government was turned almost exclusively to the gold washings and to the working of the diamond mines; and the policy of the administration consisted in the exaction of taxes and duties, which were collected from the fortified ports, to which trade was solely confined. Foreigners were excluded or jealously watched, and trade was paralyzed by numerous restrictions. In the interior, the lands situated on the great rivers, after being surveyed, were frequently presented, after the year 1640, by the kings of the house of Braganza, to the younger sons of the Portuguese nobility, whom the system of entails excluded from the prospect of inheritance. These grantees enlisted adventurers, purchased negro slaves by thousands, and subjected the original inhabitants or drove them from their districts, and ruled their dominions with almost unlimited sway. The missions of the Jesuits also received similar donations from the kings. They organized a brave militia from the converted savages and their descendants, and bore the sword and the cross farther and farther into the interior. Equally independent with the secular lords of the soil, they united the converted savages in villages and parishes along the rivers. The celebrated Jesuit Vieira introduced the cultivation of spices, in which Holland alone had hitherto traded. As these Brazilian proprietors defrayed from their own means the above-mentioned indemnifications made to the Dutch, the Portuguese government, in return, confirmed and enlarged all the privileges of the ancient planters, extending them to the present and future possessions of these noble families. But in the end the government multiplied its own monopolies, and assumed prerogatives interfering with the interests of the ancient and rich landlords. Even from 1808 to 1821, as long as the court resided in Rio Janeiro, the Portuguese by birth continued to have the preference in the high offices of state before the chief native families; and the system of taxing the productions of Brazil, and the importation of articles needed by the Brazilian nobility for themselves and slaves, was even extended. The government finally placed obstacles in the way of increasing the number of the latter, which the rich landlords deemed indispensable for the establishment of new plantations. The vessels,

moreover, always had a stumbling-block in their way in the fiscal prerogative of the court, that the land which the vassal called his own, but which he had hitherto neglected to search for gold or for diamonds, in case of any future discovery of such treasures, should be the property of the crown, or at least the object of high taxation. Even the humanity of the government, in attempting to ameliorate by laws the condition of the slaves, was a subject of offence, because it appeared to the lords to be an injury to their legal property to proceed in such a matter without their consent. Without ascribing to the Brazilians any democratic propensities, all these circumstances must have awakened the desire of independence in their breasts, as much as it augmented their hatred of the Portuguese. From these two causes a conflict of parties of several years' duration at length took place, the result of which was the late empire.

On the invasion of Portugal in 1808 by the French, the sovereign of that kingdom, John VI., sailed for Brazil, accompanied by his court and a large body of emigrants. Soon after arriving there he began to improve the condition of the country by placing the administration on a better footing, and throwing open its ports to all nations. On the fall of Bonaparte the king raised Brazil to the rank of a kingdom, and assumed the title of King of Portugal, Algarve, and Brazil. The revolution which took place in Portugal in 1820, compelling the king to return to that country, he next year sailed for Lisbon, leaving Pedro, his eldest son and successor, as Lieutenant and regent. But as the Portuguese Cortes were not willing to grant the entire equality of civil and political relations demanded by the Brazilians, and had expressly declared that Brazil was to be divided into governments, and ruled by the ministry of state at Lisbon, and the prince-regent was to be recalled to Portugal—such violent convulsions were excited in Rio Janeiro and various parts of Brazil, Dec. 1821, that it was explicitly declared to the prince-regent that his departure would be the signal for establishing an independent republic. The prince, therefore, resolved to remain in Brazil, and gave a public explanation of his reasons, Jan. 9, 1822, to his father, to the Cortes in Portugal, and to the people of Brazil. The Portuguese troops were removed from Brazil. The prince-regent assumed, May 13, 1822, the title of 'perpetual defender of Brazil', and in June convened a national assembly, composed of 100 deputies, to frame a separate constitution for the country. The National Assembly of Brazil declared the separation of that country from Portugal, August 1, 1822, and, October 12, appointed Dom Pedro the constitutional Emperor of Brazil. The new emperor retained, at the same time, the title of 'perpetual defender of Brazil'.

The king, after some slight and ineffectual attempts to re-establish the former relations between Portugal and Brazil, acknowledged the independence of the latter country in 1825. Some years afterwards a series of tumultuary proceedings ended in the abdication of Dom Pedro, who left Brazil on April 7, 1831, leaving his son, who was under age, as his successor. The rights of the latter were recognized and protected, and a regency of three persons appointed by the Chamber of Deputies to conduct the government during his minority. In 1840 the young emperor was declared of age, being then in his fifteenth year, and was crowned on July 18, 1841. The new government had considerable difficulty in crushing the republican and revolutionary party, which kept up a series of struggles in several provinces for some years. In 1845 the insurgents had all laid down their arms, but in 1848 a new rising took place, which was put down not without difficulty in the following year. In 1851 a war broke out with Rosas, dictator of Buenos

Ayres, in which Brazil was joined by Paraguay, Uruguay, Corrientes, and Entre Rio, and which ended in favour of the allies. From this war Brazil received a certain impulse. The trade now increased, the finances of the country improved, and the government began to further the development of the country by constructing roads, encouraging immigration, and fostering the education of the people. In 1853 the Bank of Brazil was founded, and the construction of railways began. In 1859 a minister for agriculture, commerce, and public works was appointed, and a large government loan for the construction of railways was authorized. In 1863, in consequence of the arrest of three English naval officers, a misunderstanding arose with England, which led to the termination of diplomatic relations for a time between the two countries. Meanwhile (Nov. 1864) hostilities had been commenced by the Paraguayans under President Lopez against Brazil, in consequence of the interference of the latter in the affairs of Uruguay; and in May, 1865, an alliance for the purpose of carrying on war against Paraguay was concluded between Brazil, the Argentine Confederation, and Uruguay. This war, the brunt of which had to be borne by Brazil, lasted till 1870, the Paraguayans having maintained a heroic resistance, and having only given up the contest on the death of their leader, Lopez, in battle against the Brazilians (March 1, 1870). This struggle was attended with an immense expenditure of men and money to Brazil, but it established her reputation as a great power and secured the freedom of the navigation of the La Plata river-system. For some years after this a movement towards greater freedom went on in Brazil. In 1858 it took the form of a total abolition of slavery without compensation, and in 1889 it received further development in a revolution which overthrew the monarchy. On the 16th November a provisional government was formed, and the emperor with his family sailed for Europe. The new constitution which was immediately issued, declared that Brazil was now a republic composed of the federated United States of Brazil; each of the provinces took the position of a state, each state having its own local government, with representation in a congress appointed by popular vote. A more carefully prepared constitution was published in 1891. An insurrection, confined chiefly to the fleet, broke out in 1893. After a great deal of desultory fighting and the bombardment of Rio, it was suppressed in 1894 by President Peixoto.

BRAZILETTO, Brazil wood, especially *Casalpinia Brasilensis*. See BRAZIL WOOD.

BRAZILIAN GRASS, a name popularly given to a substance which is obtained from the *Chamærops argentea*, and which is imported into the United Kingdom for manufacturing purposes. See CHAMÆROPS.

BRAZIL NUTS. See BERTHOLLETTIA.

BRAZIL WOOD, a kind of wood yielding a red dye, obtained from several trees of the genus *Casalpinia*, natives of the West Indies and Central and South America. The best kind, *Casalpinia echinata*, is said to be found in the greatest abundance in the province of Pernambuco, in Brazil. The tree is large, crooked, and knotty; the leaves are of a beautiful red, and exhale an agreeable odour. Other kinds are *C. Brasilensis*, *C. crista*, and *C. Sappan*, or the sappan wood of the East Indies. *C. Brasilensis*, which received its specific name from growing in Brazil, was at one time plentiful in many places where it is now scarce, having been recklessly cut down. It is pale in colour when first cut, but becomes darker when exposed. The wood is hard and heavy, and as it takes on a fine polish, it is used by cabinet-makers for various purposes.

The dye is obtained by reducing the wood to powder and boiling it in water, when the water receives the red colouring principle, which is a crystallizable substance called *brasilin*. The colour is not permanent unless fixed by suitable mordants. Its aqueous solution is used by paper-stainers, and also for making red ink, some alum and acid being added. The quantity of Brazil wood imported into Great Britain is but inconsiderable. It has been shown that the term Brazil wood was applied to an East Indian dyewood long before the discovery of Brazil, which therefore, no doubt, derived its name from producing such trees in abundance.

BRAZING, or BRASS-SOLDERING, the process of uniting two pieces of brass, two pieces of copper, or one of each by means of a hard solder, that is, a solder which fuses at a comparatively high temperature. The solder is applied in the form of a coarse powder, and is always mixed with borax, which prevents the oxidation of the metals which are being soldered together. It is usual to moisten this mixture with water before spreading it over the surfaces to be joined. When the solder has been applied in this state, the pieces of metal are slowly heated, by which the water is made to evaporate, leaving a crust of the solder on the parts where it is required. The pieces are then exposed to a stronger heat, until the borax melts and fluxes the solder, which suddenly fuses the joints of the pieces of metal, and thus unites the two surfaces, making them into one piece. The whole is now allowed to cool, and is afterwards dressed with a file. Pieces of metal which have been united in this way are held together as firmly as if they were only one piece. For the proportions used in the best solders for brazing, see **SOLDERS**.

BRAZOS, formerly called **BRAZOS-DE-DIOS**, a large river of the United States, in Texas, rising in the elevated region of North-western Texas known as the Staked Plain, between the parallels of 33° and 34°. It flows south-eastwards between the Colorado and Trinity, and after a course of about 900 miles falls into the Gulf of Mexico, between Quintana and Velasco, 40 miles w.s.w. Galveston. It is navigable by steamers during the wet season (say February to May) for about 300 miles. Among the towns on its banks the chief is Waco, about half-way from its mouth, now an important railway centre. The cotton plantations on the Brazos are highly productive.

BRAZZA (ancient *Brachia*), an island of Austria, in the Adriatic Sea, and belonging to Dalmatia; lat. 43° 16' N.; lon. 16° 37' E. It is 24 miles long, and from 5 to 7 broad; contains twenty villages, and is separated from the mainland by a channel 12 miles broad, which affords excellent anchorage for shipping. The island is very mountainous and well wooded; and in the valleys vines are grown, from which are made the best wines in Dalmatia. It produces also good oil, almonds, and saffron, and grain in small quantity. Much attention is paid to the cultivation of bees and silkworms. The chief town, St. Pietro di Brazza, has a small port, defended by a mole. At Milna there is a considerable ship-building yard (Pop. 1890), 22,650.

BREACH, the rupture or passage made in the wall of any fortified place, by the ordnance of the besiegers, for the purpose of entering the fortress. They should be made where there is the least defence, that is, in the front or face of the bastions. In order to divide the resistance of the besieged, breaches are commonly made at once in the faces of the attacked bastions, and in the ravelin. This is effected by battering, and at such places as the cannon do not reach, by the aid of mines. The breach is called *practicable*, if it is large enough to afford some hope

of success in case of an assault. This is generally considered to be the case if it allows a passage to fourteen men abreast. Frequently, however, a breach of much less extent, even of half that width, may be entered.

BREACH, in law, any violation of a law, whether the performance of an action prohibited by law, or the non-performance of a duty imposed by law.

BREACH OF ARRESTMENT, in Scots law, an act of contempt of legal authority, committed by an arrestee disregarding the arrestment used in his hands, and paying the sum or delivering the goods arrested to the common debtor. Formerly the person guilty of breach of arrestment might be prosecuted both in a civil and criminal court, but there are no instances of such prosecutions in more recent times, and all that the person guilty of it now exposes himself to is an action for damages to the extent of the funds paid away and the expenses.

BREACH OF CLOSE, in English law, any entry upon another man's property which is not warranted by being made in the exercise of a right. Thus the entry upon another's property is not a breach of close, when it is made in exercise of a right of way or a right of common, or when one enters in order to demand payment of money from the proprietor which is payable on the land, or when he enters to pay money in the same circumstances. It is also justifiable for a landlord to enter upon another's property to distrain for rent, for one who has a reversionary interest in an estate to enter to see that no injury is done to it, and, of course, for anyone to enter an inn or public house without the express permission of the proprietor, for that permission is implied in the fact of his keeping such a house. It is not necessary to constitute breach of close that the property unwarrantably entered should have an actual fence inclosing it, for every man's land is regarded as inclosed in the eye of the law, even though any actual inclosure be wanting. One who is guilty of breach of close is liable to an action for damages at the hands of the injured party, and the liability extends even to a trespass committed by his cattle.

BREACH OF COVENANT, the act of violating an agreement in a deed either to do or not to do something. One who commits a breach of this nature is liable to a civil action.

BREACH OF CONTRACT. See CONTRACT.

BREACH OF DUTY, the non-performance of a duty, or the performance of it in such a manner that injury is done to one's employer, through want of integrity or due diligence and skill. It is assumed that there is an implied contract between an employer and the person that he employs, according to which the latter agrees to perform the duties intrusted to him in such a manner that the interests of his employer shall not suffer. In case of breach of duty what is called an action of *assumpsit*, that is, an action for the recovery of damages for the non-performance of a promise, which, though not under seal, is yet founded on proper consideration, may be brought by the one who has sustained an injury, against the persons by whom the breach has been committed.

BREACH OF PEACE, the taking part in any riot, affray, or tumult, which is destructive to the public tranquillity, or the causing others to do anything to injure the public tranquillity. The former are actual, the latter constructive breaches. In both cases the breach of the peace may be either felonious or not felonious. The felonious breaches of the peace are three in number; (1) The riotous assembling of twelve or more persons, and not dispersing upon proclamation; (2) The riotous demolishing of churches,

houses, buildings, or machinery; (3) maliciously sending, delivering, or uttering, or directly or indirectly causing to be received, knowing the contents thereof, any letter or writing threatening to kill or murder any person. The remaining offences are not felonious, and include—(1) affrays; (2) riots, routs, and unlawful assemblies, which must have at least three persons to constitute them; (3) tumultuously petitioning; (4) forcible entry or detainer, which is committed by violently taking or keeping possession of lands or tenements with menace, force, and arms, and without the authority of the law; (5) riding, or going armed, with dangerous or unusual weapons, terrifying the good people of the land; (6) spreading false news; (7) false and pretended prophecies, with intent to disturb the peace. Finally, there are two constructive breaches of the peace, namely, challenging another to fight, or bearing such a challenge, and the making public by either printing, writing, signs, or pictures, malicious defamations of any person, especially a magistrate, in order to provoke him to wrath, or expose him to public hatred, contempt, and ridicule.

BREACH OF POUND, the act of destroying or breaking into any pound for the purpose of rescuing cattle that have been distrained for rent and deposited in the pound. It is an indictable offence, the cattle being deemed to be in the possession of the law.

BREACH OF TRUST, is a violation of duty by a trustee, executor, or any other person in a fiduciary position. A trustee is not permitted to manage an estate intrusted to him in such a manner as to derive any advantage to himself, and at the same time he is bound to manage it in such a manner that the person for whom he has it in trust shall reap from it the greatest possible advantage. Accordingly money held in trust by a trustee must be invested by him in government stock, or in certain other special securities, for the behoof of him for whom he has the money in trust; and if he has not done so he is, as a general rule, liable for interest on the trust funds. Formerly it was the duty of the trustee to invest money in government securities alone, but under certain acts (unless the trust deed expressly forbids) a number of other sound investments are allowed, as Bank of England stock, railway debenture stock, &c. A trustee who has grossly mismanaged his trust may have to repay money lost, with five per cent interest, and sometimes compound interest. The Court of Chancery has adopted two rules to guide the decisions with respect to the liability consequent upon a breach of trust. The purport of the first is, that with a view not to strike terror into persons acting for the benefit of others, the court will deal leniently with trustees who have endeavoured fairly to discharge their duty, and in case of any misapplication of the trust money the court will not hold the trustee liable on allight grounds. The second rule is, that care must be had to guard against any abuse of their trust on the part of the trustees. A fraudulent misuse of trust funds is punishable as a misdemeanour with fine and imprisonment. According to the law of Scotland, the punishment may vary from imprisonment for a few months to penal servitude. (See **TRUSTEE**.) On all these applications of the term breach in law, consult Wharton's Law Lexicon and Bell's Dictionary of the Law of Scotland.

BREAD. In the earliest antiquity we find the flour or meal of grain used as food. The inconvenience attending the use of the grain in its natural state, and perhaps the accidental observation that when bruised and softened in water it formed a paste, and when dried again a more compact, mealy substance, led by degrees to the artificial preparation of bread. Easy as it seems to us, it must have been

a long time before it was completely successful. The grain was no doubt first bruised between stones, and from the meal mixed with milk and water a dry, tough, and indigestible paste was made. The subjecting of this paste to the action of fire would be an improvement subsequently introduced. Latterly, and probably accidentally, it was observed that by bringing the paste into a state of fermentation its tenacity is almost entirely destroyed, and the mass when baked becomes bread—porous, agreeable to the taste, digestible, and consequently healthy. The use of machinery in the operations of bread-making is now common in the larger establishments.

Bread, as is well known, is made from the flour or meal of the cereals, maize, millet, and rice being principally used for the purpose in the more southern countries, rye, barley, and oats in the more northern, and wheat in the intermediate and temperate regions; but other vegetable products, such as beans, peas, lentils, turnips, carrots, potatoes, and even the bark of trees, are also sometimes employed either alone or mixed with the flour of the cereals. Beet and flour, in the proportion of equal weights, have been found to constitute a nutritious and palatable bread, and a very nutritious bread may also be made from the flour of beans and peas. By far the greater proportion of the bread consumed in the British Islands is made from wheat flour, though in the country districts of Scotland oatmeal cakes or bannocks are still used to some extent. Their use is decreasing every year, however. Rye-bread is not much used in Great Britain, but in the northern parts of Europe it is more common than wheaten bread. It is darker in colour than the latter, and a little less nutritious. In Westphalia a kind of very coarse black bread, called *Wasserpökel* (which see), is made from rye, of which the peasants bake one large loaf for the whole week. In many parts of Germany bread is made of grain nearly entire, or but just bruised.

Bread is either fermented or unfermented. In making the former, leaven or yeast is used, which causes it to rise, and gives it the well-known spongy texture of the common loaf; the latter is made without yeast, and is more dense and solid than the former, except where the effect of fermentation is produced by chemical means, as in aerated bread. (See below.) A great proportion of the biscuits manufactured, those known as ship-biscuits in particular, are unfermented. In a good many parts of England, especially in the country districts, people are in the habit of making their own bread, and those accustomed to the home-made bread generally prefer it to that of the bakers. It is sweeter, more compact, and full-flavoured, and keeps much longer. The process of bread-making, that is, of making the common fermented loaf, as it is practised in bakeries in Great Britain, is generally as follows:—The first thing to be done towards the manufacture of a batch of bread is, in the language of the baker, *to stir a ferment*. For this purpose water, yeast, flour, and some potatoes mashed and strained through a colander, are mixed together and worked up into a thin paste, in which, on being left at rest for a time, an active fermentation sets in, the carbonic acid generated causing the mixture to rise and fall. In about three hours the fermenting action is at rest, and the mixture may now be used, but it is not generally used till at the end of four or five hours. The next operation is called *setting the sponge*. This consists in stirring up the above ferment well, adding some lukewarm water, and mixing in as much flour as will make the whole into a pretty stiff dough, which receives the name of the *sponge*. The sponge being kept in a warm place begins to ferment in the course of an hour or so, heaving and swelling up till at last

the imprisoned carbonic acid bursts from the mass, which then sinks or collapses. 'This is called the *first sponge*.' But as the fermentation is still going on, the carbonic acid soon causes the sponge to rise again as before to nearly twice its volume, when the carbonic acid bursting through the mass causes it to fall a second time; and this constitutes what the bakers call the *second sponge*. The rising and falling might then go on for twenty-four hours, but as the alcoholic would pass into the acetous fermentation soon after the second rising, the baker always interferes after the second and very frequently after the first sponge. The bread made from the first sponge is generally sweeter; but unless the best flour is used, and even then, the loaf that is made from it is smaller in size and more compact than that which is made with the second sponge. In hot weather, however, as there would be much danger of the bread turning sour if the sponge were allowed to *take a second fall*, the first sponge is frequently used' (Ure's Dictionary of Arts, &c., by Hunt). The next process is called *breaking the sponge*, and consists in adding to it the requisite quantity of water and salt, the sponge being torn to pieces by the hand and thoroughly mixed with water. The remainder of the total quantity of flour intended to be employed is now gradually added, and the whole is kneaded into a dough of the due consistency. The kneading is a most important process, as the rising or complete fermentation of the bread, and consequently its wholesomeness, largely depends upon it. It is known to have been carried far enough when the hand, on being pushed into the mass of dough, is withdrawn without any adhering to it. The dough is now allowed to remain in the trough till it rise or *give proof*—an interval of from one and a half to three or four hours, according to the kind of yeast employed—and it is then weighed off into lumps, which are shaped into loaves and placed in the oven. There they are exposed for about an hour to a temperature of 570° Fahr., which is gradually allowed to fall to 430° or 420°, and in the process of baking they swell to about double their original size. The yield of a sack of flour is ninety to ninety-two 4lb. loaves. Three kinds of yeast are used by bakers: brewer's yeast or barm, German yeast, and patent or hop yeast. The first is that derived from ale only, as porter yeast is too bitter; German yeast is obtained from the *Unterhefe* in the brewing of beer (see BREWING) and is now largely imported into Great Britain; patent yeast consists of a decoction of hops, to which malt with some brewer's or German yeast is added. Several qualities of flour are used, and are known by the names of *firsts* or *whites*, *seconds* or *households*, and *thirds*. The latter two contain a certain proportion of the bran. *Brown* or *whole-flour* bread is pretty extensively eaten in Great Britain, and is considered to be very wholesome. It is made from undressed wheat, and consequently contains the bran as well as the flour. As the bran consists of a great extent of gluten, starch, fatty, and other nutritious substances, many contend that it is an error to remove it from the flour, since thereby a large amount of nutriment is altogether lost to the public, while the *fine* flour that remains is both less nutritious and less digestible than if the bran were retained. That there is more nutriment in the whole meal than in the flour is certain, but it has been alleged that the former is apt to pass through the alimentary canal too quickly to allow of its nutriment being properly extracted. Still there is no doubt that for many constitutions it forms a very healthy and suitable food.

Formerly, when chemistry was less advanced than it is now, breadmaking or 'panification' was con-

sidered a great mystery, and a special kind of fermentation was ascribed to it by philosophers. Now, however, it is resolved into the simplest operations resulting from common and acknowledged causes. The cereals contain in their grains, deposited in cells, a substance called gluten, exactly the same in composition as flesh. It is present in larger quantity in the centre than at the surface of the grain. An average quality of the flour consists of

Gluten.....	12
Starch.....	70
Sugar.....	5
Gum.....	3
Water.....	10
	<hr/> 100

When water is added to the flour in the first operation of baking, it unites with the gluten and starch, and dissolves the gum and sugar. The yeast or barm added acts now upon the dissolved sugar, especially at an elevated temperature, and produces the vinous fermentation, forming alcohol, and setting free carbonic acid as a consequence of the transformation of the elements of the sugar. The gaseous carbonic acid is prevented from escaping by the glutinous property of the nitrogenous ingredient, and if the mixing or kneading has been properly performed, it remains very equally diffused through every part of the dough. The amount of sugar thus decomposed is very small in amount, probably never exceeding 1 per cent of the weight of the flour, or one-fifth of the sugar present in it. The alcohol and carbonic acid are carried into the oven with the dough, and the former partially escapes, while the latter gas, being expanded by the heat, endeavours to do so, but meets with obstacles, not only from the gluten, but also from the starch, which the heat causes to pass from its insoluble to its soluble state, and in doing so it becomes much inflated by the escaping gas. The regulation of the temperature is important, because if it were urged too quickly, the bubbles of gas bursting through their prison would unite together into larger bubbles, and form those large cavities which the good baker dreads so much to see. Many attempts have been made to economise the alcohol expelled by the heat, but none have met with success, the quantity produced being so small as not to repay the expense of its collection.

When starch is roasted it passes into a kind of gum, which is, to a small extent, formed in the crumb of the bread, but much more largely in the crust. The outer part of the loaf receiving the heat, loses much of its water; its starch passes into gum; its sugar into caramel; and this, aided by a like change in the other organic matters, produces the peculiar colour of the crust. The flour, during baking, has united with much water, the loaf generally containing 43 per cent, while flour has only 10 per cent. In workhouses and large establishments, where the bread is baked in connected loaves, and not in separate cans, the amount of water is as much as 50 per cent, or one-half of the whole weight. One hundredweight of flour baked into bread will therefore produce on an average about 180 lb. of the latter. It will thus be obvious that a pound of flour contains considerably more nutriment than the same weight of bread. The changes, however, which have taken place during the formation of the latter render it more easily digestible, and hence better adapted for the purposes of nutrition.

We have now to say a few words on *aerated bread*, or unfermented bread, which receives its sponginess or porosity from carbonic acid supplied artificially, and not produced by fermentation. Bread of this sort has been made in small quantities for a good

many years, but it is only in quite recent times that its use has become at all extensive. In a pamphlet entitled *Instructions for making Unfermented Bread*; by a Physician, published in 1846, hydrochloric acid and bicarbonate of soda were recommended as agents for producing carbonic acid in the loaf, nothing else being added to the flour except water and salt; but carbonic acid water is now generally employed for the same purpose, according to the process invented by Dr. Daughlish. Since water is capable of absorbing carbonic acid in quantities equal to its own bulk, the water to be used in kneading the dough is placed in a strong iron box, and has a large quantity of carbonic acid forced into it by means of pressure. The flour and salt are contained in another strong air-tight vessel, inside of which there is a kneading apparatus worked from without through a closely-packed stuffing-box. By means of a connecting pipe the water is introduced into the latter vessel, where it undergoes the same pressure, and the kneading apparatus is set to work. When the kneading is thoroughly performed the pressure is removed, and the escape of the gas raises the dough or sponge. The loaves are baked in separate tins, the requisite quantity for a loaf being divided off into the tins by mechanical means. An improved oven was invented by Dr. Daughlish which consists of a long chamber with an endless chain travelling along it, and forming a kind of movable bottom, in which the tins containing the loaves are placed, and are baked in their progress from one end to the other. Bread made in this way is as sweet and agreeable to the taste as any fermented bread; it is light and uniform in texture, and as it retains some of the valuable ingredients of the flour that are lost by fermentation, it is preferable on the score of its nutritive properties. For dyspeptic persons and infants it is highly recommended. Another thing in its favour is its cleanness and purity. It contains nothing but flour, water, and salt; and as it is scarcely touched by the hand in the process of making, those who use it are not disgusted to think that their bread may have been laboriously kneaded by the hands of some perspiring and not over cleanly workman; for kneading-machines, which should be used in every bakery, are by no means common yet, though several have been invented. Improved ovens have also been invented, and to some extent introduced. We may mention, in particular, the hot-water oven of Mr. Perkins.

Bread is adulterated with a good many substances, such as sulphate of copper, carbonate of magnesia, chalk, plaster, starch, potatoes, &c., but the substance most commonly used for this purpose is alum. Alum enables the baker to give to bread of inferior flavour the whiteness of the best bread, and also to keep in the loaf an undue quantity of water, which, of course, increases its weight. Boiled rice is also used for the same purpose. Bakers adulterating bread are liable to a penalty of not more than £10 and not less than £5 for every offence, and to have their names advertised in the newspapers. In the making of bread the flour or meal of wheat, barley, rye, oats, buck-wheat, Indian-corn, rice, beans, pease, and potatoes, may be used, along with salt, eggs, water, milk, and leaven or yeast of any kind; but any other ingredient is regarded as an adulteration. All bread except French or fancy bread and rolls must be sold by weight (avoirdupois), and bakers must provide a beam and scales with weights for the purpose of weighing it if required. Bread made wholly or partially of any other grain or grain than that of wheat, must be stamped with the letter M. The penalty of adulterating flour or meal is not more than £20 nor less than £5. Bakers are also pro-

hibited from making bread or rolls on the Lord's-day, and from selling bread, or baking meat, pies, &c., after half-past one o'clock of that day, under a penalty of 10s. for the first offence, 20s. for the second, and 40s. for every subsequent offence. The regulations as to Sunday baking do not extend to Scotland.

BREADALBANE, a district in the western part of Perthshire, in the centre of the Grampians, which here cover a large tract of the county in length and breadth. This district is a complete mixture of high and low hills, yielding pasture for large flocks of sheep or shelter for game, with intermediate valleys, some of which are susceptible of cultivation, while others are merely mosses of peat and heath. Loch Tay lies in the centre of the district. Kenmore and Killin are the largest villages. The Marquis of Breadalbane is the chief proprietor.

BREAD-FRUIT. The bread-fruit is a large, globular fruit of a pale green colour, about the size of a child's head, marked on the surface with irregular six-sided depressions, and containing a white and somewhat fibrous pulp, which when ripe becomes juicy and yellow. The tree that produces it (*Artocarpus incisa*) belongs to the natural order Artocarpaceæ (nearly allied to the Urticaceæ or nettle tribe), and grows wild in Otaheite and other islands of the South Seas. It is about 40 feet high, with large and spreading branches, and has large bright-green leaves, deeply divided into seven or nine spear-shaped lobes. The eatable part of this fruit lies between the skin and the core, and it is as white as snow and somewhat of the consistence of new bread. When gathered it is generally used immediately: if it be kept more than twenty-four hours, it becomes hard and choky. The inhabitants of the South Sea Islands prepare it as food by dividing the fruit into three or four parts and roasting it in hot embers. Its taste is insipid, with a slight tartness, somewhat resembling that of the crumb of wheaten bread mixed with Jerusalem artichoke. Of this fruit the Otaheiteans make various messes by mixing it with water or the milk of the cocoa-nut, then beating it to a paste with a stone pestle, and afterwards mingling with it ripe plantains, bananas, or a sour paste, made from the bread-fruit itself, called *maluë*. It continues in season eight months, and so great is its utility in the island of Otaheite, 'that,' observes Captain Cook, 'if, in those parts where it is not spontaneously produced, a man plant but ten trees in his whole lifetime, he will as completely fulfil his duty to his own and to future generations, as the native of our less temperate climate can do by ploughing in the cold of winter and reaping in the summer's heat as often as these seasons return; even if, after he has procured bread for his present household, he should convert the surplus into money and lay it up for his children.' Not only does this tree supply food, but clothing, and numerous other conveniences of life. The inner bark, which is white and composed of a net-like series of fibres, is formed into a kind of cloth. The wood is soft, smooth, and of a yellowish colour, and is used for the building of boats and houses. In whatever part the tree is wounded, a glutinous, milky juice issues, which when boiled with cocoa-nut oil, is employed for making bird-lime, and as a cement for filling up cracks in such vessels as are intended for holding water. Some parts of the flowers serve as tinder, and the leaves are used for wrapping up food and other purposes.

As the climate of the South Sea Islands is not very different from that of the West Indies, it was thought desirable that some of the trees should be transferred to the growing state to the British islands there; and it was for this purpose that the *Bounty* sailed in 1787

to the South Seas, under the command of the well-known Bligh. This expedition being unsuccessful (see *BLIGH*), a second, also under Bligh, was fitted out in 1791. He arrived in safety at Otaheite, and after an absence from England of about eighteen months, landed in Jamaica with 352 bread-fruit trees in a living state, having left many others at different places in his passage thither. From Jamaica these trees were transferred to other islands; but the negroes, having a general and long-established predilection for the plantain, the bread-fruit is not much relished by them. Where, however, it has not been generally introduced as an article of food, it is used as a delicacy; and whether employed as bread or in the form of pudding, it is considered highly palatable by the European inhabitants.

BREAKING BULK, the act of beginning to unlade a ship, or of discharging the first part of the cargo.

BREAKWATER, a work constructed in front of a harbour to serve as a protection against the violence of the waves. The name may also be given to any structure which is erected in the sea with the object of breaking the force of the waves without and producing a calm within. Accordingly, many of the jetties and similar constructions in the neighbourhood of harbours may properly be called breakwaters, if they are sufficient to protect the vessels inside them, at the same time that they effect the other purposes for which they are built. Breakwaters are generally solid and made of stone, but there are also floating breakwaters which serve the same purpose. These are built of strong open woodwork, divided into several sections, and secured by chains attached to fixed bodies. Each section is about 80 feet in length, 20 feet in breadth, and 32 feet in depth, of which about 24 are under water. The breakers pass between the beams of such a structure as if through a sieve, and in passage nearly all their force is destroyed. It is estimated that a breakwater of this description will last for twenty-five years. Stone breakwaters are usually constructed by sinking loads of unwrought stone along the line where they are to be laid, and allowing them to find their angle of repose under the action of the waves. When the mass rises to the surface, or near it, it is surmounted with a pile of masonry, sloped outwards in such a manner as will best enable it to resist the action of the waves, or it is covered, as at Plymouth, with large blocks of stone, which do not rise high above the surface of the water. Sometimes the breakwater has to be constructed of solid masonry from its foundation. The breakwater at Dover is built in this way, there being no stone in the neighbourhood to form a base of the kind described. The most gigantic breakwater ever constructed is that which was erected by French engineers to protect the harbour of Cherbourg. The most remarkable of the English breakwaters are those at Portland, Plymouth, and Dover. In America there are breakwaters of immense magnitude at the mouth of the Delaware and Buffalo, the latter intended as a protection against the storms on Lake Erie, which are sometimes very violent. Among the ancient structures of this kind may be mentioned the piers of the Piræus near Athens, and of Rhodes, and also the mole of the harbour of Civita Vecchia (*Centumcellæ*) built by the Emperor Trajan. See *CHERBOURG*, *DELAWARE BAY*, *DOVER*, *PLYMOUTH*, and *PORTLAND*.

BREAM (*Abramis bream*), a species of fish sometimes called carp-bream, belonging to the family Cyprinidae of the Abdominal Malacoptygii, or fishes with soft rays in their paired fins. It is about 2 to 2½ feet long, of a yellowish-white colour, changing with age to yellowish-brown; pectoral and ventral

fins tinged with red; dorsal, anal, and caudal fins tinged with brown. Its scales are large, its irides of a golden yellow, and its cheeks and gill-covers silver white. It is found in many European lakes and rivers, and affords good sport to the angler, but is a very coarse and insipid food. Besides this species other fourteen have been recognized in Europe and the East Indies.—This is also the name of a kind of sea fish generally called the sea-bream, to distinguish it from the common fresh-water or carp-bream. Most of these belong to the family Sparidae of the order Acanthopterygii, or fishes with spiny rays in their paired fins. One of the British sea-fishes called bream (*Brama Rasi*) belongs to the family Chætodontidae, of the same order as the Sparidae. Some of the varieties of this fish are the Black Sea-bream, the Common Sea-bream, a fish nearly allied to the Gilthead, the Short Sea-bream, &c.

BREAST, THE FEMALE, is of a glandular structure, containing vessels for the secretion of milk, and excretory ducts, which open by small orifices in the nipple, and discharge the secreted fluid for the nourishment of the child. At the centre of each breast there is a small projection, the nipple, and this is surrounded by a dark ring termed the areola. The nipple is the part which the infant seizes in its mouth, and through the passage of which the milk flows into the mouth of the child in the act of suction. The glandular structure of the breast is covered by fat, except at the fore-part of the nipple and the integument. The breast is liable to many diseases, from irritation during nursing, bruises of the part, undue pressure from tight clothes, and from constitutional causes. Inflammation of the breast is very common during nursing, or from a superabundant secretion of milk. After delivery the nourishment of the infant being from the breast, there is an increased determination of blood to that part to enable it to perform the necessary function, and thus, when there is any cause of irritation, there is a tendency to increased action in that part, which frequently terminates in inflammation. Lactæal swelling is another troublesome disease of the breast. It is confined to the nipple, and consists of a large collection of milk in one of the lactiferous tubes, the orifice of which has been closed from inflammation. See *MAMMARY GLANDS*.

BREAST-PLATE, a piece of defensive armour covering the breast, originally made of thongs, cords, leather, &c. (hence *lorica cuirass*), but afterwards of brass, iron, or other metals. It may be considered as an improvement of the shield or buckler, which was borne on the left arm, and moved so as to protect successively all parts of the body. It being perceived that the free use of both hands in the employment of offensive weapons was important, the defensive armour, was attached to the body, and received different names from its position, use, &c. as for instance, breast-plate, cuisses, greaves. These different species of defensive armour are of little use against fire-arms, and have therefore generally fallen into disuse in modern war. (See *CUIRASS*).—*Breast-plate*, in Jewish antiquity, was a folded piece of rich, embroidered stuff worn by the high-priest. It was set with twelve precious stones bearing the names of the tribes. It was also called the *breast-plate of judgment*, because it contained the Urim and Thummim.

BREAST-WHEEL. See *HYDRAULICS*.

BREAST-WORK, in the military art, every elevation made for protection against the shot of the enemy. Wood and stone are not suitable for breast-works, on account of their liability to splinter. The best are made of earth; in some circumstances, of fascines, dung, gabions, bags of sand, and of wool. The thickness of the work must be in proportion to the artillery of the enemy. In general it ought not

to be less than 10, nor more than 18, or at most 24 feet thick. The rule of Cugnot is, that the breast-work should be so high that nothing but the sky and the tops of trees can be seen within cannon-shot from the interior of the intrenchments. If this rule cannot be followed on account of the height of neighbouring mountains, the interior of the fortification ought to be secured by traverses.

BREATH, the air which issues from the lungs during respiration through the nose and mouth. This operation is performed without effort, but still it causes a motion in the external air, before the nose and mouth. The air expired is the vehicle of sound and speech. A smaller portion of oxygen and a larger portion of carbonic acid is contained in the air which is exhaled than in that which is inhaled. There are also aqueous particles in the breath, which are precipitated by the coldness of the external air, in the form of visible vapour; likewise other substances which owe their origin to secretions in the mouth, nose, windpipe, and lungs. These cause the changes in the breath, which may be known by the smell, like the other qualities of the air. In youth, the breath is insipid, and contains acid; it loses these qualities after the age of puberty, and becomes more agreeable. With advancing age, it becomes again unpleasant. A bad breath is often caused by local affections in the nose, the mouth, or the windpipe; viz. by ulcers in the nose, cancerous polyp, by discharges from the mouth, by sores on the lungs, or peculiar secretions in them. It is also caused by rotten teeth, by impurities in the mouth, and by many kinds of food (viz. horse-radish, onions, and also by flesh, if used to the exclusion of other food), and by fevers. In the last case it often varies with the character of the disease. The remedy for the complaint must depend on the causes which produce it. Substances of an aromatic kind, which have a strong rich smell, should be chewed to diminish its offensiveness. But it is often impossible to remove this unpleasant disorder.

BREATHING. See **RESPIRATION**.

BRECCIA, a conglomerate composed of angular pieces of the same or of different rocks, united by a cement or matrix, which, according to its nature, forms the several varieties of calcareous, silicious, &c. The conglomerate known by the name of *pudding-stone* differs from that of breccia only in having the composing fragments rounded. Calcareous breccia is often found in the form of fine marble, apparently composed of fragments produced by some disrupting force, and then united by the infiltration of carbonate of lime among them. The angular form of the fragments seems to indicate that they have never been exposed to much friction, and have therefore probably originated at no great distance from their present site. In some cases a kind of spurious breccia has been formed by the breaking up of calcareous beds, and their subsequent union by means of infiltration, without any change of their original position. Marble breccia thus formed is remarkable for the size of its fragments. In the calcareous districts of many countries caverns and extensive fissures are seen filled with a reddish mass, composed of lime, sand, and oxide of iron, inclosing angular fragments of different rocks, and a great number of bones more or less broken. To such masses the name of *osseous breccia* has been given. They are most frequently met with on the shores of the Mediterranean.

BRECHE-DE-ROLAND, that is 'the breach of Roland', a mountain pass in the Pyrenees, between France and Spain, which, according to a well-known legend, was opened up by Roland, one of the paladins of Charlemagne, with one blow of his sword Durandal, in order to afford a passage to his army. It is an immense gap between the walls of a

mountain carrier rising to the height of 9500 feet above the level of the sea, and from 800 to 900 feet above the bottom of the defile. The defile itself varies in width from 200 to 300 feet. It lies about 43 miles to the N. of Huesca, from which it can at times be seen, when it appears like a small notch in a stony ridge. The violence of the wind in this pass is described as being in tempestuous weather truly terrific.

BRECHIN, a royal and parliamentary burgh of Scotland, in Forfarshire, is romantically situated on the left bank of the South Esk, 12½ miles N.W. of Forfar, and 8 W. of Montrose. The principal street is about 1 mile in length, extending from the N. part southward to the bridge over the river, which is an old fabric of two large arches. Another main street branches off this, about the middle of the town, and stretches in a south-easterly direction for more than ½ mile. There are also several cross streets and lanes. Brechin is a very ancient royal burgh, and was formerly walled. The industry carried on consists chiefly of the manufacture of linens, and the neighbourhood exports a considerable quantity of grain. There are in or quite close to the town several extensive linen factories, a flax-spinning mill, two bleachfields, a nursery, a brewery, two distilleries, and a paper-mill. In ancient times there was an abbey of Culldeer in this place, and in 1150, when Brechin was constituted an episcopal see by David I., it is supposed that the site of this establishment was that chosen for the foundation of the cathedral. The cathedral church of St. Ninian, which now forms the parish church, is situated on the N. edge of a precipitous ravine, which separates the burgh-lands from those of Brechin Castle. It is a stately Gothic fabric, which, after having been marred by modern alterations, has just undergone restoration, the ruined chancel being rebuilt, a large northern transept added, galleries removed, &c. The steeple is a square structure 70 feet in height, surmounted by a hexagonal spire of 50 feet. At the south-west angle of the church is the ancient round tower of Brechin, similar to those of Ireland. It is a tapering structure of freestone, 86 feet 9 inches high to the cornice, and 15 feet more to the top of the modern conical roof. The Mechanics' Institution is a handsome building, with a beautiful hall. There is a public library lodged in a neat edifice. Adjacent to the town, and only separated from it by the before-mentioned ravine, stands Brechin Castle, the ancient seat of the Mailes of Panmure, and now of the Earls of Dalhousie, their successors. The castle is built on a precipitous rock overhanging the river Esk. Pop. of parli. burgh in 1881, 9031; in 1891, 8955; in 1901, 8941.

BRECON, or **BRECKNOCK**, a county of South Wales, having a length from N. to S. of 38 miles, a breadth varying from 14 to 34 miles, area, 719 square miles; pop. (1891), 57,031; (1901), 59,904. It is one of the most mountainous counties of the principality, and presents much bold and magnificent scenery. Near its centre rises the mountain called the Vn or Boscon, belonging to the Black Mountains, which traverse its S. portion from E. to W. It has a height of 2901 feet, and is the culminating point of South Wales. The rocks belong chiefly to the old red sandstone or Devonian system; but it also contains a considerable development of mountain limestone and a small and inferior portion of the great Welsh coal-field. Notwithstanding the rugged nature of the surface, not much less than a half of the whole is under cultivation. The river Wye forms a natural boundary between this county and Radnor, and the Usk, rising in the

Black Mountains, crosses the county and flows through a fine valley towards the town of Brecon. About 2 miles E. from the latter is Brecknock Mere, one of the largest lakes in South Wales, abounding in otters, pike, tench, perch, and eels. The climate is in general temperate and salubrious. A considerable quantity of agricultural produce is sent to the markets in the neighbouring English counties. The chief manufactures are coarse woollens, stockings, and other worsted stuffs; there are also extensive ironworks. The county returns one member to Parliament.

BRECON, or **BRECKNOCK**, the capital of the above county, previous to 1885 a parliamentary borough, stands near its centre, in an open valley at the confluence of the Honddu and Usk, and consists chiefly of three principal and several minor streets, tolerably straight and well built. Three bridges span the Honddu and one the Usk. The principal edifices are the county-hall, county jail, barracks, Christ's College (an educational institution on the model of the large public schools), the Independent Theological College, and several of the places of worship. St. John's Church is a fine old building, cruciform, with a massive tower, partly early English, partly in later style. Pop. in 1891, 5794; in 1901, 5875.

BREDA, a town in Holland, province of North Brabant, 24 miles south-west of Bois-le-duc, on the Merk, a navigable river which connects it with the Meuse. Breda, being a strong frontier fortress, was formerly of the greatest importance to Holland, as the chief point of the line of fortresses in front of the Meuse. The fortifications consisted of fifteen bastions, as many ravelins, and five horn-works, besides the citadel. These being removed, the chief strength of the place now lies in its marshy environs, which may easily be laid under water. Breda received city rights in 1534 since that time it has often been a subject of contention between the Dutch, Spaniards, and French. It was delivered by treachery into the hands of the Duke of Parma in 1681, but was retaken by Maurice of Orange in 1690. The latter capture was accomplished by means of a boat loaded with turf, in which seventy Dutch soldiers were concealed. Spinola took Breda in 1625, after a siege of ten months, but it was retaken by the Dutch under Frederick Henry of Orange, in 1637. During the French revolutionary war Dumouriez made himself master of the city and fortress in February, 1793, and would thereby have prepared the way for the conquest of Holland had he not been forced, by the loss of a battle at Neerwinden, to evacuate the city and fortress, April 4. In September, 1794, Breda was attacked by the army of Pichegru, but did not surrender till all Holland was conquered, in the winter of 1794. On the approach of the Russian vanguard, under General Benkendorf, in Dec. 1813, the French garrison made a sally, and the patriotic citizens, profiting by the occasion, rose en masse, shut the gates, and prevented the French from returning into the town. A peace was concluded at Breda between England and Holland in 1667. Pop. (1897), 26,160.

BREDA, JAN VAN, a painter, born at Antwerp in 1683; died 1750. He studied at first under his father, who had acquired some reputation, but afterwards became a close imitator of Breughel de Velours and Wouvermans, of whose works he made copies, which the most practised eye is scarcely able to distinguish from the originals. He resided several years in England, where he enjoyed a high name, and was much employed by the king and the nobility. On his return in 1725 he was appointed director of the Academy of Antwerp, and was so highly valued by his townsmen that his paintings were often the objects of keen competition.

BREDOW, GABRIEL GONFRY, professor of history in Breslau, was born in Berlin in 1773, of poor parents. He died in 1814. He was for a time professor at Eutin, and a colleague of the celebrated Voss; afterwards professor at Helmsstadt, and still later at Frankfort-on-the-Oder, whence he went to Breslau on the removal of the university to that place. He was distinguished for his patriotism and his literary works. His *Handbuch der alten Geschichte* (Manual of Ancient History) passed through five editions, the fifth of which appeared in 1825. He is the author of *Chronik des neunzehnten Jahrhunderts* (Chronicle of the Nineteenth Century); *Epistole Parisienses* (he went to Paris in 1807 to collect all that has been left to us by the Greek geographers); *Untersuchungen über Geschichte, Geographie, und Chronologie* (Researches on History, Geography, and Chronology); and of the very useful *Historische Tabellen* (Historical Tables), which were translated into English.

BRÉE, MATTHAUS IGNATIUS VAN, a Belgian painter, was born at Antwerp in 1773, and died there in 1839. He studied at the Academy of Antwerp, and under Vincent at Paris. He chiefly excelled in historical painting, for which he gained a prize in 1797. His characteristics are said to have been originality and vigour of conception and patience in execution, yet he worked with great rapidity, as he presented Napoleon in a few hours a tableau of the manoeuvres of the fleet on the Scheldt before Antwerp. His first work which attracted attention was the Death of Cato. Among his principal works are Rubens Dictating his Dying Testament; The Tomb of Nero at Rome, with a group of itinerant musicians and Lazaroni; Death of Count Egmont; Van der Werff addressing the famished populace during the Siege of Leyden in 1676—the burgomaster is represented as saying, 'Take my body and divide it amongst you.' Van Brée had the title of painter to the Empress Josephine, and represented many scenes connected with the French occupation of Belgium. He replaced Herreyens as director of the Academy of Fine Arts at Antwerp, and gained a high reputation by his teaching. He also evinced a capacity to excel in sculpture and lithography.

BREECH OF A GUN AND BREECH-LOADING. The breech of a gun is that portion of a gun immediately behind the bore, and which in modern small arms and artillery is removed to enable the process of loading to be effected. The chief advantages of this method, over muzzle-loading, are that it greatly increases the quick-firing capacity of the weapon, and adds to the length of range and accuracy of aim, while affording much facility for cleaning. Though it has only been successfully adopted in quite modern times, the breech-loading principle is nothing new, as some of the earliest cannon were so constructed. The first weapon of this description utilized as a regular military arm was the *needle-gun* adopted by the Prussian government so long ago as 1841, though its efficacy and superiority for warlike purposes was not demonstrated till the successful campaigns of Prussia against Denmark and Austria in 1864 and 1866. Other nations also speedily armed their troops with breech-loading rifles, the French having adopted the Chassepôt breech-loader in 1866, and in Britain the old Enfield rifle having been converted into a breech-loading weapon, and supplied to the troops the same year. In 1871 the Snider or converted Enfield began to be superseded by the Martini Henry rifle, and this again has been superseded in the British army by the Lee-Metford magazine rifle. Other European nations have also adopted different forms of breech-loading rifles. The principle of breech-loading has also been applied to artillery, the names of Armstrong and Krupp being associated with

some of the first modern guns of this type. Its effective use in large guns presented many difficulties, and breech-loaders after being introduced in the British service were for a time discarded in favour of muzzle-loaders. The latter are certainly simpler and stronger; but the former, while facilitating loading, expose the gunners less to the fire of an enemy, especially when the gun is firing through a ship's port or the embrasure of a fort. A new type of breech-loading ordnance of steel has lately been adopted by the British authorities. See GUN, MUSKET, RIFLE, &c.

BREECHES, a garment for the legs, especially, as distinguished from trousers, for covering the upper portions of the legs. In England they were formerly called hose. Breeches or hose were in use even among the ancient Babylonians, and with them were made so as to cover the foot and supply the place of stockings. In Europe we find hose first used among the Gauls, hence the Romans called a part of Gaul *breeched Gaul* (*Gallia braccata*). In the fifth century they had become fashionable in Rome. In the time of Queen Elizabeth and James I. the breeches had assumed enormous dimensions, being stuffed out with various materials, as wool, hair, &c. King James's partiality for such breeches is well known, and we find him represented in an old engraving with wide stuffed breeches tapering to the knee, slashed and adorned with lace. In the reign of Charles I. they took the form of short trousers, loose at the knee, and ornamented with ribbons, lace, &c. In the time of William III. the tight knee-breeches came in, and have been supplanted by trousers only in the present century.

BREECHING, a rope used to secure the cannon of a ship of war, and prevent them from recoiling too much in the time of battle. It is of sufficient length to allow the muzzle of the cannon to come within the ship's side to be charged.

BREEDING is the art of improving races of domestic animals by continuous attention to their pairing, in conjunction with a similar attention to their feeding and general treatment. Both plants and animals show great susceptibility of modification under systematic cultivation. We owe our cereals, our most important garden herbs and fruits, and our finest flowers to the continued cultivation of wild stocks, which in their original form bore but slight resemblance to, and gave few indications of, the qualities of the perfected specimens. In animals the same susceptibility of modification exists to so great an extent that it would almost seem, on looking in the gross at what has been accomplished by it, to be unlimited. Experience, however, shows that great as are the results of systematic breeding, there are well-defined limits to its power; and that its application is attended with many difficulties, even the very ease with which modifications may be produced rendering it liable to abuse; for in breeding the difficulty is not merely to effect changes, nor even to effect them continuously in a desired direction, but to select with proper judgment and due forethought of both near and remote consequences the directions in which it is most desirable to effect them. Both cultivators of plants and breeders of animals, when very desirous of producing a particular quality in great perfection, frequently sacrifice other qualities unduly to it. This may be done to such an extent as to hazard even the permanence of the quality preferentially developed by destroying the basis on which it rests. The tendency to do this is in fact one of the best-defined limits to the power of breeding. There can be no doubt that by long and systematic cultivation the sum of desirable qualities in particular races, both of plants and animals, has been greatly increased, and

that in two ways. Individual specimens have been produced possessing a much higher sum of desirable qualities than any specimens of the original stock could have exhibited; and from the same stock many varieties have been taken, developing different perfections, the germs of all of which may have been contained in the original stock, but which it would have been impossible to develop simultaneously in a single specimen. But when an effort is made to develop rapidly, or to its extreme limit, any particular quality, it is always made at the expense of some other quality, or of other qualities generally, by which the intrinsic value of the result is necessarily affected. High speed in horses, for example, is only attained at the expense of a sacrifice of strength and power of endurance. The celebrated merino sheep, from which the fine wool of Saxony is taken, are the result of a system of house breeding which reduces the general size and vigour of the animal, and diminishes the value of the carcass. When animals are bred, as in Great Britain, for supplying the market with meat, the yield can, on the contrary, be greatly increased by stall-feeding; but the flavour of meat so produced, however fine its appearance, is never equal to that of free animals, and genuine quality is sacrificed to quantity. In seeking to effect improvement by breeding or cultivation, therefore, much care and judgment are needed to calculate not merely how a particular effect may be produced, but how it may be produced with the smallest sacrifice, and so as to leave the greatest balance of advantage in favour of the improver.

Breeding, as a means of improving domestic animals, has been practised more or less systematically wherever any attention has been paid to the care of animals. The great number of varieties to be found among horses, dogs, pigeons, and other domestic animals, is in great measure to be attributed to the care of breeders. It is not from any theory, but from common observation, that a knowledge of the advantages of a regular attention to breeding has been derived, and the facility with which it may be used as a means of effecting given purposes has always been readily discovered by those who have paid attention to the subject. It is only about a century and a half, however, and in particular in connection with the improvement of the breeds of cattle and sheep, that the subject has received much attention as one of distinct scientific investigation in relation to agriculture. The attention of rearers of sheep and cattle has for about that period been turned to the advantages of breeding. One of the earliest improvers, to whom more than any one else the opening up of the new era was due, was Robert Bakewell, of Dishley, in Leicestershire. Commencing his experiments about 1745, he found at that time no general attention paid to the different breeds throughout the country. Every district had its own particular ideas of excellence, and generally confined itself to its own breed, many of which were very inferior. Bakewell took at once a mercantile view of the subject, and urged the general cultivation of those qualities which were best suited for producing profitable results. He travelled the country, disseminating his principles, and he succeeded, after great sacrifices, in producing, besides other improvements in cattle and horses, the celebrated Dishley breed of Leicestershire sheep, which has since maintained a high reputation. Bakewell's principle in forming his stock was to aim at producing 'fine forms, small bones, and a disposition to make fat readily'. More recently the subject of breeding has been much discussed by theorists as well as by practical breeders. The result of investigation has been to show that in the course of the improvements effected, there has often been a great

waste of power. One improver, for example, has sacrificed the wool of a particular breed of sheep to the carcass; another has subsequently improved the wool but diminished the yield of meat, the facility with which different objects might be accomplished thus often leading to more fluctuation in the aims of the breeders than was consistent with steady improvement. Thus much has been ascertained by the general observation of results, and a few leading principles have been laid down, but little exact knowledge has been acquired as to how the improvements of breeding are effected. Opposite theories are contended for with equal zeal, while the practical skill of the experienced breeder appears to derive little assistance from either, successful experiment as well as opinion being ranged on both sides of the question. Breeding is thus still to a great extent a matter of individual judgment and experience, even those who know most about it differing in their explanation of the facts, and of the causes to which they assign their own improvements. In this state of matters we shall indicate briefly a few of the leading facts and opinions in regard to the remarkable improvement which has been effected in the breeds of sheep and cattle in this country, which has made our stock the wonder and admiration of other countries.

That a great and general improvement in the size, weight, and quality of our sheep and oxen has been effected, is undoubted; and it is equally undoubted that this improvement has been due to the continued application of the skill of practical breeders. This is proved by the fact that improvement has closely followed the state of our markets. The impress which Bakewell gave to the movement has continued more consistently than any other characteristic which has attended it. Quantity of meat, smallness of bone, lightness of offal; in cows, yield and quality of milk; in sheep, weight and fineness of wools, have all been studied with remarkable effects; but those who have had occasion to observe the details of the improvements, will find in all of them a close relation to mercantile value. In particular cases, cows have been made to yield milk much superior to the general quality, but the quantity of the yield in these cases is limited, and improvement in this direction has consequently been restricted. Experiment has shown that British sheep can be made to yield longer and finer wool than is usually taken from them; but with the British coat of feeding, and with the British market for meat close at hand, the inducement to bring wool to the highest attainable perfection is outweighed by the immediate advantages of a good yield of fair quality, together with a valuable carcass. On the other hand, it pays eminently to bring sheep and oxen early to the market, and the age at which an animal reaches full condition has been considerably advanced in this direction. While an improvement such as this affords abundant evidence of the great susceptibility of change in animal nature, it is less conclusive in regard to the settlement of first principles than a similarly extensive experiment conducted on a purely theoretical basis might have been. It is therefore the less surprising to find differences of opinion on theoretical points. One point may be stated with confidence, as generally admitted, and as the true basis of practical improvement; and beyond this it is scarcely safe to go. It is on the individual selection of suitable animals that the improvement of qualities transmitted by descent must rest, and the more gradual the stages of improvement are—that is, the more similar the breed of the animals possessing distinctive differences—the more surely may the improvement be maintained and transmitted in succeeding generations. This fundamental principle gives a standing-point to the advocates of both

the opposite theories of *in-and-in* and cross breeding. Theorists generally are opposed to the former, and it is commonly held by them as tending to degeneracy. This is stoutly denied by some practical breeders, and not without an appearance of facts on which to rest their opinion. If *in-and-in-breeding* has its dangers, it cannot be denied that cross-breeding has its. When the breeds are too dissimilar, there is always a tendency in subsequent generations to relapse to their former types. There is the still greater danger when the breed experimented upon has valuable qualities, of sacrificing them for a doubtful equivalent. The number of experiments frequently made in opposite directions has already been alluded to as an abuse to which cross-breeding is liable. When the practice of breeders is dominated by a general principle, such as the mercantile desire of profit alluded to, there is a further danger, not perhaps sufficiently considered, of destroying original types, and bringing the qualities of the different breeds into a dead level of uniformity. This may seem inconsistent with the variety of practice just referred to, but is not really so. Although starting on different roads, and sometimes in diverging directions, our breeders all tend to the same point, and ultimately reach it by abandoning their divergences. The tendency of modern breeding, like many other tendencies of civilization, is more and more to the production of uniform types. The history of the different British breeds affords some curious instances of the rapid and extensive conquest of superior over inferior breeds; and the same process is still going on, governed by the same principle, an exact calculation of the mercantile returns of each breed. If this calculation always comprehended every element of ultimate value, there would be no danger, as differences of locality would condition difference of breed; but mercantile calculations are not usually so profound, and their tendency hitherto has been in the direction of levelling distinctions. All the desirable qualities of a species, as has been already mentioned, are not, however, developed in a single variety. The gardener, whose glory it is to produce every possible development of beauty in the forms of his plants, is in no danger of forgetting this. The breeder of cattle, who looks to an immediate return for a large quantity of cheaply fed meat, is very differently situated. Perhaps the dangers of *in-and-in-breeding* are associated more than is suspected with the practice of castration, which forms so universal a part of the artificial treatment of domesticated, and especially of gregarious animals, and which in the course of a few generations must bring the stock of a particular owner into the closest consanguinity. If this is so, probably many of the advantages of cross-breeding might be gained without destroying particular breeds by frequent and judicious interchanges among neighbouring breeders. When there is a deficiency of desirable qualities in any breed, there can be no risk in having recourse to cross-breeding; but when a particular breed, such as our West Highland cattle, possesses high excellencies, it is probably safer to leave them undisturbed. For an account of the different breeds of British cattle and sheep, see Dr. MacDonald on Cattle, Sheep, and Deer. See also our article AGRICULTURE.

BREZZES, SEA AND LAND. See WIND.
BREGENZ (ancient *Brigantium*), a town of Austria-Hungary, in Vorarlberg, 77 miles w. by N. Innsbruck; pop. in 1890, 6789. It occupies a beautiful site on a slope which rises from the Lake of Constance and terminates on Mount Gebhard, where the ruins of the ancient stronghold of the Counts of Montfort are still seen. It consists of an old town, which is very poorly built, and a modern, which is more attractive. Among its edifices are three churches

and two monasteries. Its chief manufacture is framework and other wooden fittings for houses, and it trades in corn, fruit, wine, butter, and cattle. There are salt-petre works, blast furnaces, and coal-mines in the vicinity.

BREHON (Irish, *breitheam*, a judge), an ancient magistrate among the Irish. These magistrates seem to have been hereditary, and before the introduction of Christianity they probably combined the offices of judge and priest. They administered justice to their respective tribes—each tribe had one brehon—seated in the open air upon some sods placed on a hill or eminence. Spenser in his *View of the State of Ireland* refers to the Brehon law as an unwritten code handed down by tradition. He expresses no favourable opinion of it either in regard to the distribution of property or the security of life. In his view of the practical working of the law he was probably right, but he was mistaken in regarding it as an unwritten code. Patriarchal as was the administration of the Brehon law, its transmission was not left to tradition. In the earliest manuscripts extant it is said to have been revised by St. Patrick and other learned men, who expunged from it the traces of heathenism, and formed it into a code called the *Senchus Mor*, about 440, and it is implied that a previous written code existed. The Brehon law was exclusively in force in Ireland until the year 1170. Various ineffectual attempts were made by the English government to suppress it, by the statute of Kilkenny (Edward III.), 1366, by acts of Henry VI., in 1440 and 1450. It was finally abolished by James I. in 1605. The Brehon laws, like other laws passed at the same period of European history, contained, with some rude principles of justice, many barbarous institutions. The state of society indicated in them seems to be a sort of transition from the communal ownership and periodical repartition of the land, found among several Teutonic nations, to a manorial organization. Several distinct social ranks are indicated, ranging from the nobles to the serfs. They had regular courts, with the right of appeal from lower to higher ones. Most offences, even including murder, could be commuted by fines, which were fixed with minute precision; but the fines were paid in kind, since coined money was unknown. The laws also carefully provide for and regulate the rearing of the children of the upper classes by members of the subordinate classes. The marriage laws were of a very loose character, and the law of inheritance is obscure and complicated. Until recently these laws have been involved in great obscurity. A commission was appointed by the Earl of Eglinton, as lord-lieutenant of Ireland, in 1852, to superintend the publication and translation of the ancient laws of Ireland; and between 1865 and 1885 an edition of the *Senchus Mor* was published in five volumes. See also Sir H. S. Maine's *Early History of Institutions*.

BREISGAU. See **BRINGAU**.

BREITENFELD, a village of Saxony, in the circle of, and 4 miles S. of, Leipzig. Here two battles were gained by the Swedes during the Thirty Years' war. In the first, fought on 7th Sept. 1631, Gustavus Adolphus, joined by the Saxons, defeated Tilly and Pappenheim; in the second, on Nov. 2nd, 1642, Torstenson, who had succeeded on the death of Baner to the command of the Swedish army in Germany, again defeated the Imperialists under the Archduke Leopold and Piccolomini, who had advanced to the relief of Leipzig, invested by the Swedes. Leipzig surrendered after the battle. Breitenfeld was also the scene of a portion of the battle of Leipzig, won by the allies against Napoleon, 16th to 19th October, 1813.

BREMEN, a port and free city of Germany, and an independent member of the empire, one of the three Hanse towns, is situated on the Weser, about 50 miles from its mouth, in its own small territory of 98 square miles, besides which it possesses the town and port of Bremerhaven at the mouth of the river. The town is divided into the old town (Altstadt), on the right bank of the river; the new town (Neustadt), on the left bank of the river; and the extensive suburbs (Vorstadt). The first is separated from the suburban quarters adjoining by the ramparts of the city, now converted into fine walks and pleasure-grounds, and forms a sort of semicircle on the right bank of the river. The new town lies on the left bank of the river opposite the old, with which it is connected by three bridges, two of them crossing the main stream, and the third crossing an arm of it called the Little Weser, besides a railway bridge. Extensive suburbs lie on this side also. The streets of the old town are generally narrow and crooked, and lined with antique houses in the style of the middle ages. This is the business quarter of the city, and contains the chief public buildings, including the cathedral, the old Gothic council-house, with the famous wine-cellar below it, the modern town-hall, the *Schütting* or merchants'-house, the old and the new exchange, &c. The new town has straight, well-built streets, lined mostly with dwelling-houses and shops. The suburbs also consist chiefly of dwelling-houses, and as these often have gardens in front, the streets have a very pleasant aspect. The chief ecclesiastical building is the cathedral, a Romanesque edifice, founded in 1044, subsequently added to at various times, and in 1838-93 provided with two new western towers. There are several other old and interesting churches, as those of St. Ansgar, St. Stephen, and St. John. Among buildings of recent erection are the court-house, savings bank, and railway-station. There are several squares and open spaces, and besides the pleasure-grounds formed from the ramparts, a large public park has been laid out on the N. side of the town. Bremen is well supplied with schools and other educational institutions, and possesses a museum, a library (120,000 vols.), an observatory, &c. The manufacturing establishments include tobacco and cigar factories, sugar-refineries, rice-mills, iron-foundries, and machine works, rope and sail works, and ship-building yards. It is from its commerce, however, that Bremen derives its importance. Its situation renders it the emporium of Hanover, Brunswick, Hesse, and other countries traversed by the Weser, and next to Hamburg it is the principal seat of the export and import trade of Germany. Recently the Weser has been deepened so that sea-going ships drawing 17 feet of water can now ascend to the Bremen docks, but the great bulk of the shipping trade centres in Bremerhaven and Geestmünde. Bremerhaven is now a place of over 18,000 inhabitants, and is provided with excellent docks capable of receiving the largest vessels; it is connected by railway with Bremen, where the chief trading companies, merchants, and brokers have their offices. The greater portion of the German trade with the United States passes through Bremen, and it is the chief port of emigration on the Continent. The chief imports are tobacco, raw cotton and cotton manufactures, wool and woollen manufactures, rice, coffee, grain, petroleum, &c., which are of course chiefly re-exported to other parts of Germany and the Continent. The imports and exports are now each of the annual value of over £40,000,000. The population of the town in 1897 was 148,188; of the total territory (including Bremerhaven), 202,465.

Bremen first rose into note about 788, when it was

made the seat of a bishopric by Charlemagne. It was afterwards raised to the dignity of an archbishopric, and by the end of the fourteenth century it had become virtually a free imperial city. At the treaty of Westphalia in 1648 the archbishopric was secularized, and became a duchy under the supremacy of Sweden. In 1731, when the Elector of Brunswick gained possession of the duchy, the privileges of Bremen as a free city were confirmed. From 1810 to 1813 it formed part of the French Empire. The constitution is in most respects republican. The legislative authority is shared by the senate, a body of eighteen (twelve of whom must be lawyers, and five merchants) elected for life, and presided over by two of their own number alternately, who have the title of burgomaster; and by an assembly of 150 citizens elected for six years. The executive power is entrusted to the senate and senatorial committees. In 1896-97 the revenue of Bremen amounted to £927,384, and the expenditure to £1,322,382. The total debt amounted in 1897 to £7,117,991, and was contracted entirely for public works.

BREMER, FREDERIKA, a Swedish novelist of European reputation, born near Åbo in Finland on Aug. 17th, 1801; died at Arsta, 31st Dec., 1865. At the age of eight she wrote verses both in Swedish and French. She early visited Paris, and at subsequent periods of her life, up to 1861, she travelled in America, England, Switzerland, Italy, Turkey, Greece, and Palestine. She also resided for some time in Norway. She wrote an account of her travels; but her fame chiefly rests on her novels, which depict with great simplicity, tenderness, and humour the manners and life of Sweden and Norway. They have been translated into German, French, and English. She exercised some influence in her own country as a social reformer. The English titles of some of her principal works are *The President's Daughters*, *The Neighbours*, *Nina*, and *Strife and Peace*.

BREMERHAVEN. See **BREMEN**.

BRENDAN (or **BRENNAIN**), SAINT, of Clonfert, was born in 484 at what is now Tralee in Kerry. He was educated under his relative Bishop Erc, and St. Jarlath of Tuam, and was ordained by the former. Shortly afterwards he went on a seven years' voyage in search of 'the mysterious land far from human ken', but without success. Later he visited and lived in Brittany for a time; and after his return he again set out to seek the distant paradise, which he ultimately found. When he again reached Ireland he founded the monastery of Clunain Feara (Clonfert), and he seems to have visited Scotland at this time. He died in 577. His two voyages form the basis of the celebrated mediæval legend of the Navigation of St. Brendan; but in the legend they are united into one and combined with other stories. Where Brendan's voyages really led him we do not know. The Book of Lismore contains a life of St. Brendan.—Another Irish saint of the same name was born about 490 and died in 573. He was a friend of Columba, and founded a monastery at Birr (Parsonstown) in King's County.

BRENNER, MOUNT, a mountain in the Tyrol, situated between Innsbruck and Sterzing, and between the rivers Inn, Aicha, and Adige, forming part of the Tyrolean Alps, 6777 feet in height. The road from Germany to Italy traverses this mountain. It reaches the elevation of 4658 feet, and is about 12 miles long. This is one of the lowest roads practicable for carriages over the main chain of the Alps, and also one of the most ancient, having been used by the Romans. In 1867 a railway over the Brenner Pass was opened, so that Italy and Germany were connected by an unbroken line of rails.

BRENNUS, the name or title of several princes of the ancient Gauls, supposed to be derived from the Kymrian *brenhin*, a king. A leader of the Senones, a Gallic nation in the upper part of Italy, the most famous personage who is mentioned under this name, made an invasion into the Roman territory about the year 390 B.C. A battle was fought near the river Allia, the Romans were totally defeated, and Brennus took possession of the city, which had been previously abandoned by the inhabitants. The capitol only was provided with a garrison; but several aged citizens of rank, amounting in the whole to about eighty, had resolved to remain in the city and devote themselves to the infernal deities. Attired in their sacerdotal, consular, and triumphal robes, they seated themselves in their chairs of office in the middle of the forum, awaiting death. When Brennus arrived at the forum, he was struck with astonishment at their venerable aspect. The Gauls looked upon them as so many statues of deities, and feared to go near them, but ultimately they were all massacred. Rome was sacked, and all the inhabitants who yet remained in their houses were slain. Brennus then assaulted the capitol, and being repelled with considerable loss, he set fire to the city and levelled it with the ground. While the garrison of the capitol was in great distress Brennus attempted a surprise by night, in which he would have succeeded had not the cackling of the geese, sacred to Juno, alarmed the garrison, and the Gauls were repulsed. After six months Brennus offered to raise the siege and leave the Roman territory for 1000 lbs. of gold. When the gold was weighed, Brennus threw his sword into the scale beside the weights and cried out, 'Woe to the vanquished!' According to Polybius the Gauls returned home in safety with their booty. The Roman legend followed by Livy bears that Brennus was defeated, and his army entirely destroyed, by Camillus, a distinguished Roman exile who had retired to the city of Ardea, and who arrived with succour in time to save the capitol.—Another Brennus in B.C. 279 advanced into Greece with an enormous force, said to have amounted to 150,000 foot and 61,000 horse. After ravaging Macedonia he entered Thessaly and marched towards Thermopylæ, where an army of 20,000 Greeks was assembled, supported by an Athenian fleet on the coast. The Gauls were repulsed in a sanguinary battle, but, in order to separate the Greeks, they dispersed themselves to plunder the country. Brennus himself attacked the temple of Delphi, which was defended by only 4000 men, but was again repulsed, and carried out of the battle fainting with his wounds. Unwilling to survive his defeat, he put an end to his life by copious draughts of wine. The Greeks attributed their victory to the assistance of Apollo.

BRENTA (ancient *Medoacus Major*), a river in North Italy. Its source is Lake Caldazzone in the Tyrol, 8 miles S.E. of Trent, whence it flows S.E. with a winding course of 112 miles, and falls into the Adriatic through the canal of Brenta-nova or Brentono, at Brondolo. Formerly its embouchure was at Fusina, opposite Venice. The old course has been formed into a canal, and is the chief means of communication between Padua and Venice, the new channel being comparatively little used.

BRENTANO, CLEMENS, a German poet and romancist, was born at Frankfort-on-the-Main in 1778; died at Aschaffenburg in 1842. He studied at Jena, and resided by turns there and at Frankfort, Heidelberg, Vienna, and Berlin. In 1818 he retired to the convent of Dülmen, in Münster, and the latter years of his life were spent at Ratisbon, Munich, and Frankfort-on-the-Main. These frequent changes

were due to a restless disposition, combined with morbid and misanthropic views, which gave a peculiar character to his writings. With a powerful imagination, his genius was tinged with mysticism, eccentricity, and a strong tendency to sarcasm. He was the brother of Elizabeth von Arnim, Goethe's 'Betina.' Among his principal works are—*Satiren und Poetische Spiele*, 1800 (*Satires and Poetical Fancies*); *Godwi*, oder das Steinerne Bild der Mutter, 1801 (*The Mother's Statue*), an ultra-romantic production, which he himself calls a very wild romance; *Die Lustigen Musikanten*, 1803 (*The Joyous Musicians*); *Ponce de Leon*, 1804; *Die Gründung Prag*, 1816 (*The Founding of Prague*), said to be his most successful drama; *Gokel, Hinkel und Gakelel*, 1838, a satire on the times; *Geschichte vom braven Kaspar und dem schönen Annerl* (*History of the Brave Caspar and the Beautiful Annerl*, 2d edition, 1851), which is considered a masterpiece as a novelette.

BRENTFORD the county town of Middlesex, England, 7 miles w. of London. It has a weekly market and two annual fairs. Here Edmund Ironside defeated the Danes, under Canute, in 1016; and Prince Rupert a part of the Parliamentary forces, under Colonel Hollis, in 1642. Sion House, the magnificent edifice of the Duke of Somerset, where Lady Jane Grey resided, now belonging to the Duke of Northumberland, was built here on the site of a suppressed nunnery. Brentford has a considerable retail trade, a soap manufactory, and extensive sawing and planing mills. Pop. of Old and New Brentford in 1871, 11,081; in 1891, 13,738; in 1901, 15,171.

BRENT GOOSE, or **BRANT GOOSE**, a name applied to several geese smaller than the ordinary wild goose, darker in colour, and much more marine in their habits, whence they are also known as black geese and sea geese. The name barnacle or bernicle goose has also been applied to one or more of them, thus leading to a considerable amount of confusion. These geese generally have the beak short, slender, convex, and truncated, with edges laminated internally but not visibly from the exterior. The common barnacle or bernicle—the goose to which the name barnacle is properly applied—*Bernicla* or *Brenia leucopsis*, or *Anser leucopsis*, is much smaller than the gray goose. The back is of an ashy gray, variegated with black; the face and neck pure white; neck and tail black. It is a common winter visitor in the British Islands. An old fable made it grow on trees like a fruit, the birds being believed to take origin in the crustaceans known as *barnacles*; it was consequently eaten during Lent. The Brent goose, properly so called, the *Bernicla Brenia* or *torquata*, or *Anser Bernicla*, is still smaller, and lighter in proportion to size. The back is of a very deep gray; the head, neck, and upper part of the breast black; a spot on each side of the neck, and the under feathers of the tail, are pure white; the belly is white, the bill and feet black. The Brent goose is remarkable for length of wing and powerful flight. It is a winter bird of passage in many parts of the continents of Europe and America, particularly France, Germany, Holland, Great Britain, the United States, and Canada. Its home is in high northern latitudes, to which it retires in summer to breed. It has been observed that in summer they go far off to sea, feeding on drifting sea-weed. During its winter visits to Great Britain it frequents salt-water marshes and fens, being found generally along the coasts of England, Scotland, and Ireland, which are frequented by other species of wild geese, and abounding in the sandy and muddy flats between Holy Island and the coast of Northumberland and in Cromarty Bay. It feeds on drifting sea-weeds and saline plants, but never on fresh-water herbage.

In the winter months, beginning with November and December, it affords amusement to our sportsmen, to whom it offers an easy mark, as the instinct of the birds causes them, when alarmed, to crowd together. It is considered the finest and most delicate for the table of all the birds of the goose tribe. The London market is well supplied with it in winter.

BRESCIA (Latin, *Brizica*), a city of Lombardy, North Italy, 40 miles n.w. of Verona, and about the same distance n.e. of Lodi, on a beautiful plain on the banks of the rivers Mella and Garza. It is the capital of the province of the same name. It is a handsome and flourishing city, of a square form, about 4 miles in circuit, and surrounded by walls; its streets are spacious, and the public buildings numerous, particularly its churches, which are further remarkable for the number and value of the paintings with which they are enriched. A few of them only, however, have much pretension to architectural beauty; amongst those that have are the cathedral, a handsome structure of white marble, and the Church of San Domenico. But however plain in exterior appearance most of the Brescian churches may be, they are all richly decorated within with the most beautiful frescoes, and other creations of taste and art. The other buildings most worthy of notice are the Palazzo della Loggia, and the Broletto. The first was intended for the palace of the municipality, or town-hall; it is composed of the richest marbles, and was worked upon by the first architects of the fifteenth and sixteenth centuries successively. The Broletto, the ancient palace of the republic, combines the characters of fortress and town-hall, and is surmounted by a great tower, whose deeply-cleft Italian battlements produce a singularly grand effect. The whole is in a colossal style, and marked by the peculiar characteristics of the age in which it rose—supposed to be about the end of the twelfth, and beginning of the thirteenth centuries. The city contains also a lyceum, two gymnasia, an atheneum, a college, with a museum of antiquities, and a botanic garden; a public library, with 80,000 volumes; a theological seminary, a handsome theatre, a corn-exchange, an extensive hospital, and other educational and charitable establishments. There are seventy-two public fountains in the streets and squares, besides some hundreds of private ones. Outside the town is a cemetery, begun in 1815, designed by Vantini.

Brescia is a place of considerable trade and manufacturing industry. Near it are large iron-works, and its fire-arms are esteemed the best that are made in Italy. It has also silk, linen, and paper factories, tan-yards, and oil mills, and is an important mart for raw silk. But it derives its greatest interest from its fine Roman remains, having been at one time the seat of a Roman colony. These first attracted attention in the seventeenth century; although, as far as regards inscriptions, they had been objects of especial care to the citizens of Brescia for two centuries before this period, but it was not till 1820 that any very earnest efforts were made to bring the buried remains of entire buildings to light. Since that period some remarkable discoveries have been made, embracing besides numerous statues and inscriptions the beautiful marble temple of Vespasian, and a number of noble and magnificent Corinthian columns, with numerous fragments of mouldings and ornaments, some gilt, and all of great elegance. Brescia was the seat of a school of painting of great merit, to which many eminent artists belonged, including Alessandro Bonvicino, commonly called 'Il Moretto,' who flourished in the sixteenth century, and was remarkable for the deep devotional feeling which he threw into his sacred subjects, as well as for his excellence as a portrait-painter. The city is of great antiquity, having been

the chief town of the Cenomani, a Gallic tribe, who were conquered by the Romans. It became the seat of a Roman colony under Augustus about a.c. 15, and afterwards a municipium. In the year 412 it was burned by the Goths, and was soon afterwards destroyed by Attila; but was rebuilt about the year 452. It was taken by Charlemagne in 774. In 936 Otto I. of Saxony declared it a free city, and it so remained for nearly three centuries, taking an active part in the feuds of the Guelphs and Ghibellines, and ultimately put itself under the protection of Venice in 1426. In 1796 it was taken by the French, and was assigned to Austria by the general treaty signed at Vienna on June 9, 1815. In 1849 it was involved in the commotions of continental Europe; its streets were barricaded, but the city was eventually captured by the Austrians under General Haynau. It was ceded to Sardinia by the treaty of Zürich in 1859. Pop. (1896), 67,500.

BRESLAU, a large city of the German Empire, and the second in the Prussian dominions, being excelled in population only by the capital, Berlin, is the capital of the province of Silesia. It is situated in a spacious plain at the confluence of the Ohlau and the Oder, the latter dividing it into two main portions (the largest on the left bank), which, with islands in the river, are connected by a large number of bridges. The streets of the older quarters are narrow, those of the newer broad. There are electric and other tramways. The public squares and buildings are handsome. The fortifications which surrounded the old or inner city have been converted into promenades, and the ditch into an ornamental sheet of water. The cathedral, built in 1148-1650, and restored in 1875, the Protestant churches of St. Elizabeth and St. Mary Magdalene, the Rathhaus or town-hall, a Gothic structure of the fourteenth and fifteenth centuries, the municipal buildings, the government buildings, the building for the provincial diet, the royal residence, court-houses, exchange, and university buildings are among the most remarkable buildings. The university was founded in 1702 as a Roman Catholic university, with which was combined the Protestant one at Frankfort-on-the-Oder, transferred hither in 1811; and there are now two faculties of theology, one Catholic the other Evangelical, besides three others. The university has attached to it a museum of natural history, a cabinet of antiquities, a library of 320,000 volumes, including many old works and manuscripts, an observatory, a picture gallery, a botanic garden, &c. The number of students amounts to about 1500. There are numerous other educational institutions, as well as hospitals and asylums. Breslau carries on an extensive trade in the products and manufactures of Silesia, principally in corn, wool, metals, glass, coals, and timber. The Oder is navigable and there is a connection with Berlin by the Oder-Spree canal. The industries comprise iron-founding, bell-founding, the manufacture of machinery, railway carriages, organs and other musical instruments, cigars, oil, spirits, &c., brewing, and glass-painting. There are two annual wool-fairs, which are largely attended. The pop. in 1885 was 299,640; in 1895, 378,250; with suburbs, 405,041. Breslau was the seat of a bishopric by the year 1000; an independent duchy from 1163 to 1386; was ceded to Austria, after many wars and calamities, in 1527. It was conquered by Frederick II. of Prussia in 1741. It was from this time the scene of frequent warfare, being successively attacked by Austrians, French, Russians, and Prussians. It was twice occupied by the French, in 1807 and 1813. Its fortifications were destroyed by Napoleon in 1807, but it finally remained in the hands of Prussia.

BRESSAY, one of the Shetland Isles, E. of the mainland, from which it is separated by Bressay Sound, about 6 miles long and 1 to 3 in breadth. Its line of coast is rocky and deeply indented; the interior is hilly, rising in the Wart of Bressay to 742 feet, and is to a great extent covered with peat-moss. There are a number of small streams and small lakes. On the s. there are three bold headlands: the Ord, the Bard, and the Hammar. The inhabitants are mostly crofters, sailors in the merchant service, or fishermen. Hosiery is the only manufacture. Bressay Sound forms a safe harbour (Lerwick Harbour) about 1 mile to 1½ mile in breadth, having Lerwick on its west side. Pop. (1891), 802.

BREST, a fortified seaport and naval station of France, in the department of Finistère, in the former province of Brittany, situated at the mouth of the Penfeld, 320 miles s. by w. from Paris. It has one of the best harbours in France, and a safe roadstead, capable of containing 500 men-of-war in 8, 10, and 15 fathoms at low water, and it is the chief station of the French marine. The coast on both sides is well fortified. The entrance to the roads, known as Le Goulet, is narrow and difficult, with covered rocks, that make it dangerous to those not well acquainted with it. There are immense magazines, workshops, barracks, roperies, &c., and the dockyard employs about 8000-9000 men. Several docks are cut in the solid rock. Brest, which in the middle ages was of so much importance that it was said, 'He is not Duke of Brittany who is not lord of Brest', had sunk by the beginning of the reign of Louis XIII. to little more than a village. Richelieu resolved to make it the seat of a vast naval arsenal, but little was done till the beginning of the reign of Louis XIV., when Duquesne came to superintend the works. Vauban followed him, and fortified it. In 1694 the combined fleets of England and Holland disembarked a force which attempted to take Brest, but was repulsed with great loss. June 1, 1794, the French fleet was beaten off Brest by the British, under Howe, who took from them six ships of the line, and sunk a seventh. The manufacturing industry of Brest is inconsiderable, but its commerce is extensive. Its chief exports are cereals; its principal imports colonial produce and naval stores. The pop. in 1896 was 74,538.

BRETAGNE. See BRITTANY.

BRETEUIL, LOUIS CHARLES AUGUSTE LE TONNELIER, BARON DE, a French diplomatist, was born in the department of the Indre in 1780, and died at Paris on Nov. 2nd, 1807. After a period of military service he became in 1768 minister plenipotentiary at Copenhagen, and afterwards occupied similar posts in Sweden, Austria, Naples, and again in Vienna. His embassy to Vienna explains his attachment to the Queen Marie Antoinette. As minister and secretary of state after Necker's dismissal in 1789, he was a zealous defender of the monarchy; he was therefore considered as one of the greatest enemies of the revolution. After the capture of the Bastille (14th July) he escaped by a hasty flight. In 1790 Louis XVI. intrusted him with secret negotiations, for his restoration to the throne, at the principal northern courts. The Convention issued a decree against him. In 1802 he returned, with the permission of the government, to France.

BRÉTIGNY, a village of France in the department of Eure-et-Loire, 6 miles s.e. of Chartres, on the Paris and Orleans Railway. By the treaty of Brétigny, concluded on the 8th of May, 1360, between Edward III. of England and John II. of France, the latter, who had been taken prisoner at the battle of Poitiers, recovered his liberty on a ransom of 8,000,000 crowns, to be paid in six years.

Edward renounced his claim to the crown of France, and relinquished a portion of his conquests and possessions in that country, including Anjou and Maine, and the greater part of Normandy; receiving the cession in independent sovereignty of the duchy of Aquitaine, with all its dependencies; Gascony, Poitou, Saintonge, Aunis, Agenois, Périgord, Limousin, Quercy, Rouergue, Angoumois, together with Calais, the counties of Ponthieu and Guines, and the viscounty of Montreuil.

BRETSCHNEIDER, HEINRICH GOTTFRIED VON, was born at Gera 8th May, 1739; died 1st Nov. 1810. He was educated at the institute of Herrnhuters at Ebersdorf, entered the army as a cornet in the regiment of Count Brühl, was present at the battle of Kolin, and afterwards became captain of a Prussian free-corps, and was made prisoner by the French. During his forced stay in France he acquainted himself with the language, and with the spirit of the people. On his return he was appointed governor of Usingen in Nassau. This government being shortly suppressed, he travelled in England and France, and became associated with Count Vergennes, who employed him in diplomatic missions. He returned to Germany in 1772, and was shortly afterwards engaged in the service of Austria, where he was first named vice-governor of the banat of Temesvar. This banat having been incorporated in Hungary in 1778, he obtained the appointment of librarian to the University of Buda. Here his hostility to the monks, and especially to the Jesuits, led him into trouble; although the Emperor Joseph II., who held the same views, declared himself his protector. He was obliged to retire from Buda, and was appointed librarian at Lemberg, and also counsellor to the government. In 1809 he retired with the title of aulic counsellor. His views were liberal and somewhat sceptical, which, with his active opposition to the monastic orders, gained him many enemies. His principal works are: *Reise nach London und Paris*, &c., 1817; *Almanach der Heiligen auf 1788*; *Waller's Leben und Sitten*, &c. (1793).

BRETT, RICHARD, theologian, born 1561; died 1637. He was rector of Quainton in Berks, and assisted in the translation of the Bible under James I.

BREUGHEL, the name of a celebrated Dutch family of painters, the first of whom adopted this name from a village not far from Breda. This was Pieter Breughel, also called, from the character and subject of most of his representations, the *Droll* or the *Poosants* Breughel. He was born in 1510 (according to Mechel, in 1530), was a pupil of Peter Koeck van Aelst, travelled into Italy and France copying the beauties of nature, and after his return fixed his residence at Antwerp, where he was received into the Academy of Painters in that place. He subsequently married the daughter of his instructor Koeck, and removed to Brussels, where he died in 1570 (according to some in 1590). In his rural weddings, his rustic fests and dances, he strikingly represents the gaiety of the villagers, as he himself had frequently observed them, in disguise, in his youth. He also etched, but many of his pictures have been engraved by others. He left two sons—Pieter and Jan. The former (called the Younger Breughel), preferring subjects affording striking contrasts, painted many scenes in which devils, witches, or robbers are the principal figures. This particular turn of genius procured him the name of *Hell Breughel*. Among his pieces are Orpheus playing on his Lyre before the Infernal Deities; also, the Temptation of St. Anthony. The former picture hangs in the gallery of Florence. The second brother, Jan, was distinguished by his landscapes and small figures. From his usual dress he received the title of *Velvet*

Breughel. He also painted for other masters landscapes as back-grounds to their pieces, and sometimes little figures in them. He was a very prolific artist. In connection with Rubens he represented Adam and Eve in Paradise. The figures in this picture are painted by Rubens. This piece, his *Four Elements*, also *Vertumnus* and *Pomona*, which were all executed jointly with Rubens, are among his principal performances. He is said to have been born in 1568; other authorities say 1569, 1575, or 1589. He visited Italy, and enriched his imagination with beautiful scenery. He is said to have died in 1642, or by other authorities 1625. Other members of this family, belonging to a later period, are Ambrose, who was director of the Antwerp Academy of Painting between 1635 and 1670; and Abraham, who for a time resided in Italy, and died in 1690; the brother of the latter, John Baptist, who died in Rome; and Abraham's son, Caspar Breughel, known as a painter of flowers and fruits.

BREVE, a note of the third degree of length, and formerly of a square figure, as \square ; but now made of an oval shape, with a line perpendicular to the stem on each of its sides: — . The breve, in its simple state, that is, without a dot after it, is equal in duration to one quarter of a large, or to two semibreves, and is then called *imperfect*; but, when dotted, it is equal to three-eighths of a large, or to three semibreves, which bring the greatest length it can assume, it is then called *perfect*. It is now chiefly used at the close of passages or compositions.

BREVET, a term borrowed from the French, and applied in Britain and the United States to rank in the army conferred upon officers on account of special and long service, and higher than that for which regimental pay is received. Thus a brevet-major serves as captain in his regiment, and draws pay as such.

BREVIAIRY (from the Latin *brevarium*), a summary or abridgment of prayers. The breviary is the book containing the daily offices which all who are in the orders of the Church of Rome, or enjoy any Catholic benefice, are obliged to read. It is an abridgment of similar offices previously in use. The breviary contains prayers or offices to be used at the seven canonical hours of matins, prime, tierce, sext, none, vespers, and compline. It is not known at what time the use of the breviary was first enjoined. St. Basil, St. Jerome, and St. Ambrose speak of the seven hours called canonical. The services in use in the convents and monasteries in the early ages were very exhaustive from their great length. A council held at Tours in 567 enjoined that matins and vespers should never have less than twelve psalms each, and that the former should have thirty in Lent. It was under Pope Gregory VII. (1073–85) that the abridgment of the offices began to be considered necessary. In 1241 a breviary revised by Haymon obtained the approbation of Gregory IX., and was introduced in all the churches of Rome under Nicholas III. In 1568 Pius V. published a breviary which has remained, with few modifications, to the present day. The Roman breviary, however, was never fully accepted by the Gallican Church, which persisted in maintaining its own offices. The Ultramontane party there had long struggled in vain for the introduction of the Roman breviary, but from 1640 to 1864, by a final and vigorous effort, the imposition of the Gallican party was overcome, and the uniformity of usage generally established, though to the dissatisfaction of a large number of French Catholics.

The Psalms occupy a large place in the breviary, the order of the reading being so arranged that in general a hundred psalms shall be recited in a week.

Passages from the Old and New Testament and from the fathers have the next place. All the services are in Latin, and their arrangement, which is adapted to the various seasons and festivals of the church, is very complex. The English Book of Common Prayer is based on the Roman breviary. There is a translation of the breviary into English by the Marquis of Bute (2 vols. 1880).

BREVIPENNES, a family or sub-division of birds, but occupying a different position in different systems. Cuvier makes it a family of the order Grallæ or waders. In more modern systems it corresponds to the order of Cursorial birds or Ratitæ. It includes at least two genera, the ostrich and the cassowary. The Dodo and Apteryx are also referred to it. The Brevipennes have a resemblance in several of their distinctive characteristics to the Gallinacæ. Their pectoral muscles are reduced to extreme tenacity, and the sternum has no ridge, while the muscles of the thighs are of great strength and thickness. They are thus fitted for walking or running rather than for flying. As their name implies, their wings are short.

BREWING, the operation by which beer is produced, including under this term all kinds of liquors produced from grain by fermentation. The name beer, indeed, may be given to any beverage (as *ginger-beer*) produced by the fermentation of a fluid consisting of water sweetened with honey sugar, or molasses; but, strictly speaking, the term beer should only be applied to those beverages prepared, either wholly or partially, from malted grain by fermentation. Wine, on the other hand, is obtained by the fermentation of the saccharine juice of fruits, while *spirits* are produced by distilling some fermented liquor. The grain chiefly used for the purpose of making beer is *barley* (*Hordeum distichum*), which, after it has passed through the process known as *mashing*, is the necessary basis of almost all malt liquors. Malted wheat is also used to a very limited extent in the preparation of the German *Weizenbier*.

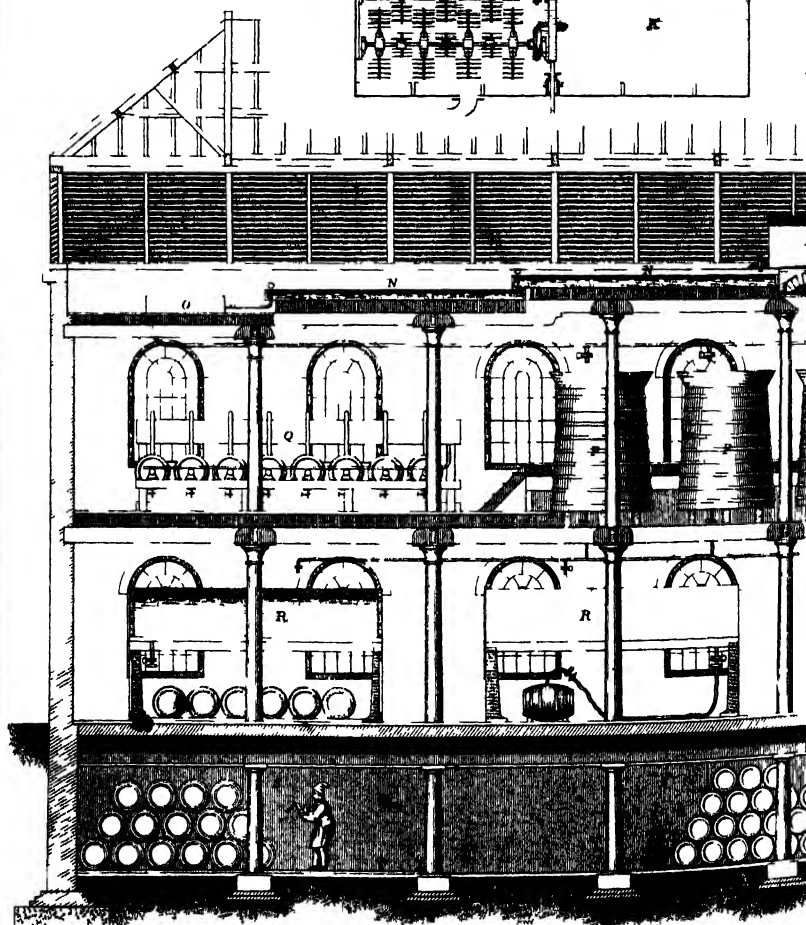
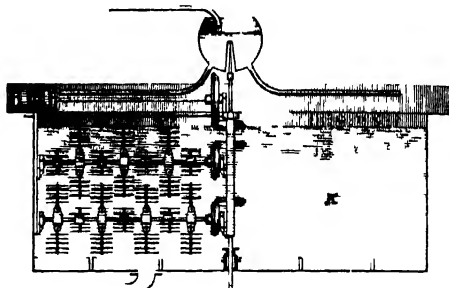
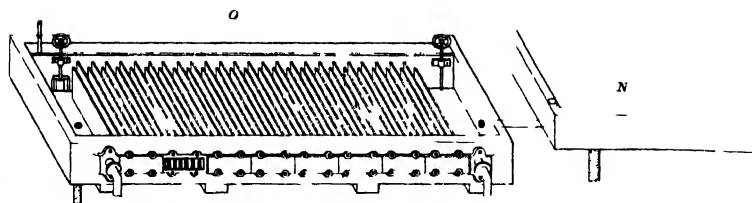
The barley best adapted for brewing purposes should be grown on a light calcareous soil or on a rich loam; heavy clay soils are most unsuitable. The quality of barley also depends largely on the climatic conditions, on the season, and on the care taken in manuring, harvesting, and stacking the grain. The barley-corn should be plump, and should possess a thin, bright, clean, and slightly wrinkled husk; whilst the body of the corn should be floury and should possess an uninjured germ. Hard and flinty barley can never yield a satisfactory malt, and barley which has become discoloured by over-exposure to rain and heating in the stack should also be avoided for brewing purposes.

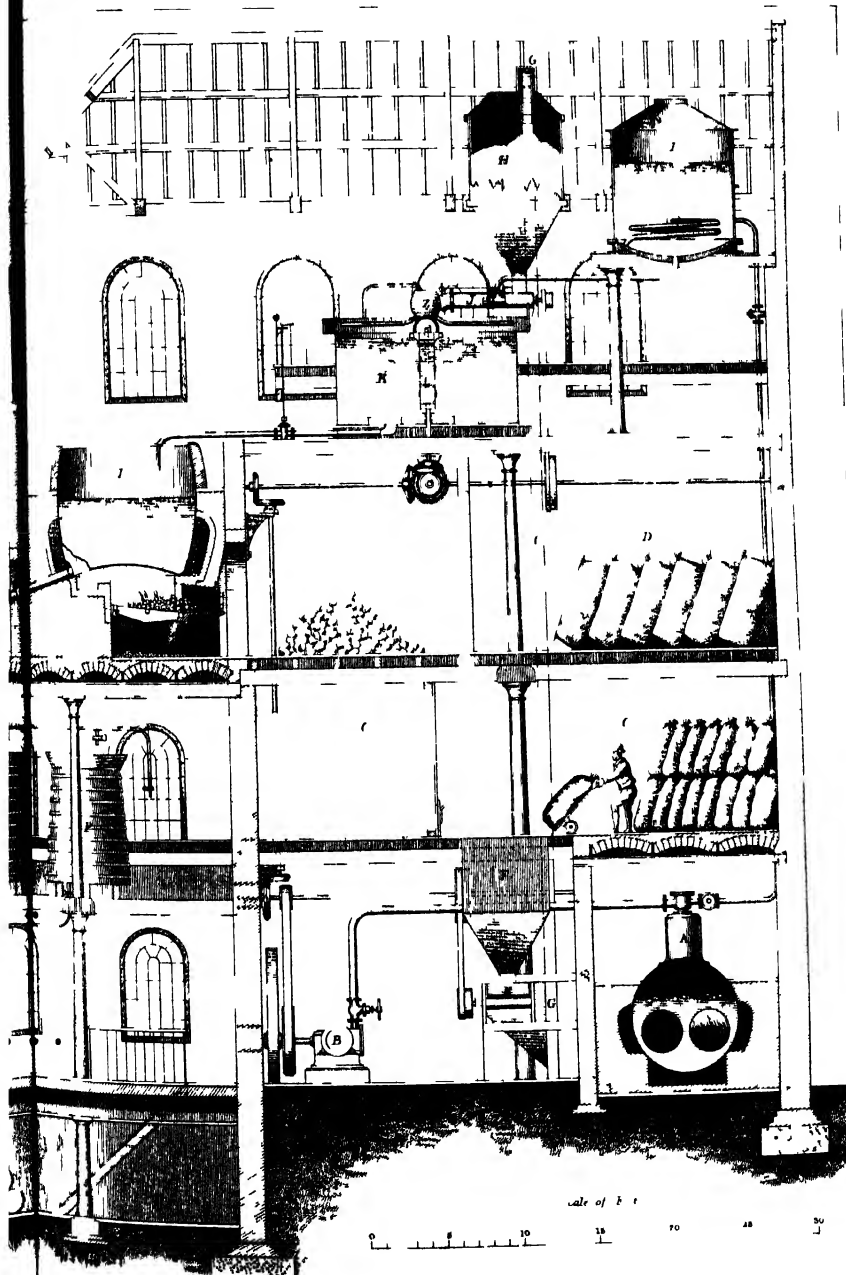
In order to prepare the barley for its use in brewing it is malted, i.e. subjected to the process of *germination* or growing, by means of which certain *enzymes* (unorganized ferments—see FERMENT) are produced, and by the agency of one or more of those ferments, the barley starch is so modified as to be readily converted at a later stage into less complex carbo-hydrates. The first operation in malting is to plunge the barley or other grain to be malted into a large cistern containing water enough to cover the whole mass. Here it is allowed to steep for a time, usually from two to four days. When the grain is sufficiently steeped the water is let off, and the grain thrown out of the cistern and piled in a heap, or, as it is technically called, a *couch*. After a few hours the bottom and inner part of the heap begin to grow warm, and the radicle or root of what would be the future plant to make its appearance. The germination thus commenced would go on rapidly but for the labour

of the maltster, who, with a view of making all the grains grow alike, checks the growth of such as are in the middle of the heap by turning them to the outside, and *vice versa*. Thus the grain is turned backwards and forwards for from seven to ten days, at the end of which period the *accespire*, as it is called, that is, the incipient stem of the plant, has nearly reached the end of the grain. The green malt is then transferred to a kiln, where, by means of a gradually increasing heat, it is dried and cured, at a higher or lower temperature according to the character of the beer to be brewed from it. Upon the character of the malt thus produced much of the success of the later processes in brewing depends; to quote a common German saying, 'the beer is made on the kiln'. The malt thus made is ground, or rather crushed, and is then ready for brewing.

The first step in brewing is called *mashing*. It consists in stirring up the crushed malt with a quantity of hot water, when the diastatic enzymes produced by malting attack the starch and convert it, by a process of hydrolysis, into a number of simpler carbohydrates, of which *maltose* and the *dextrines* are the chief members. The sweet liquid (*wort*) thus produced is drained off, leaving the husk (*grains* or *druff*) and certain albuminoids which have been rendered insoluble during the mashing process behind. The wort is then boiled for some time with the addition of some *hops*. *Hops* are the female flowers or catkins of a plant (*Humulus lupulus*) belonging to the natural order *Urticacæ* (the nettle family). The hop plant springs up from old roots in April, flowers in the end of June, and ripens in the end of August or beginning of September, when the flowers are gathered and dried. The best hop growing districts in Britain are Kent and Sussex; and very fine hops are also grown in Bavaria, Bohemia, and many other parts of the Continent, and in America. The object of boiling the wort is, in the first place, to destroy the diastatic enzymes; further, a large proportion of the nitrogenous matter is rendered insoluble, the aromatic and bitter principles of the hops are extracted and give flavour to the liquor, and all organisms are destroyed. The boiled wort is then strained off from the hop leaves, cooled to a suitable temperature, run into large vats, and fermented by the aid of yeast (see article FERMENTATION). During fermentation a large proportion of the sugar of the wort is converted into alcohol and carbonic acid, and the yeast reproduces itself and is collected for future use. After a longer or shorter period of time the liquor (*beer*) is run off into casks or vats, where, aided in most cases by the addition of a small quantity of dry hops, it passes through a slow secondary fermentation and becomes fit for consumption.

Such in brief is the process of brewing, whether the product is to be beer, or ale, or porter. But the reader will be better able to understand how it is carried on in practice at the present day by consulting the accompanying plate and by studying the following description. 1 is the boiler and 2 the engine which has to drive the malt-mill and malt elevator, the mashing-machine, &c., 3 is the malt store containing malt, partly loose in bins, partly in sacks. From the malt store the malt can be wheeled and emptied into the hopper F of the malt-mill K. Before being crushed by the two rollers of the malt-mill, the malt undergoes a thorough sifting in a sifting apparatus situated below the hopper so as to free it from extraneous matters, as also from the *comings* or dried rootlets of the malt. The sifting is accomplished by an upper sieve of a coarse mesh which allows the malt to pass through but retains the larger objects, while a lower sieve keeps back



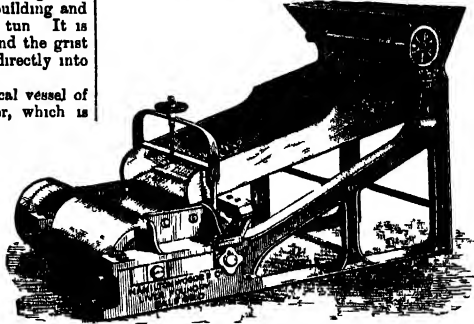


BREWERY AT WORK

but must but allows sand, comings, &c., to escape. The adjoining cut shows one form of malt mill. On being cranked by the mill the malt slides down an inclined plane into the little buckets or boxes at the end of the endless belt of the malt elevators which carries it up and empties it into the ground grist hopper B, at the very top of the building and placed over or commanding the mash tun. It is probably better for the mill to command the grist hopper so that the ground malt falls directly into it.

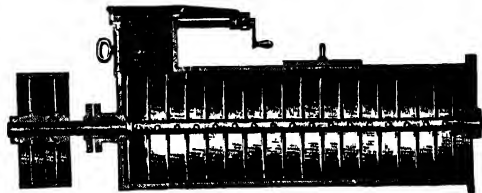
The hot water copper 1 is a cylindrical vessel of copper for heating the brewing water, which is pumped from the well into it. The water is heated by means of a steam coil in the inside of the copper, and by a steam jacketed bottom. It is generally heated up to boiling point and then cooled down to about 160° F. previous to mashing. The mashing machine J is a cylinder generally made of copper about 4 to 5 feet long and 16 to 18 inches diameter, having the one end open and the other closed. It is fitted with a spindle running through its whole length, having spokes inserted at right angles all along it, which are made to revolve at a considerable speed by means of a pulley on the end of the shaft which passes through the closed end of the cylinder. The ground malt is admitted on the top side near to the closed end by means of a sluice, and the hot water by the side just under the sluice, and by the time the mixture flows to the open end the ingredients are thoroughly broken up and intermingled. The mashing machine is fixed in a nearly horizontal position, on a level with, and the open end resting on the top edge of the mash tun. We show here a section of the mashing machine on a larger scale—this machine, which is very largely employed, being the patent of James Steel of Glasgow. The mash tun (K, shown 1 ft in position and separately on a larger scale) is a cylindrical vessel of iron about 12 feet in diameter and 6 feet deep, having a false bottom of perforated plates held about an inch from the true bottom, which has three pipes let into it so as to drain it, each with a stop cock. These generally run into one which passes on to the copper. It is in the mash tun that the useful elements are produced from the malt by means of hot water, thus yielding the sweet liquor known as wort. In the mash tun is an elaborate apparatus for stirring and properly mingling the malt with the water. A shaft passes through the bottom and up the centre of the mash tun, which has two horizontal shafts in gearing with it. These have forked arms fastened on them at intervals and are also carried round the mash tun by means of a small shaft in gearing with the central upright one and a toothed way on the edge of the mash tun. When the rakes are working, the horizontal shafts revolve on their own centre, and at the same time travel slowly round the mash tun, thus ensuring the perfect mixture and uniform heat of the mash. Mashing is carried out after this fashion.—The belt is put upon the mashing machine pulley and the machine thus set going. Hot water is run through the mashing machine till the false bottom of the mash tun is just covered, and then the malt is cautiously admitted till the mixture of water and grist has the consistency and appearance of porridge, the heat of the water being watched by means of a thermometer, and tempered by means of a cold-water

pipe. After all the grist is run into the mash tun the rakes are set going and usually made to travel three or four times round the tun. The mash tun is then covered up and allowed to stand for about three hours, after which time the taps under the tun



Malt mill

are gently opened and the wort or extract of the malt run off into the copper 1. As soon as the taps are opened the sparger 2 (shown best in the large figure C K) is set going. It is a round copper vessel balanced on a spindle above the centre of the mash tun, and has two arms branching from the underside to nearly the side of the mash tun. These arms are perforated with rows of holes along the one side in each arm, so that on water being let into the sparger the jets cause it to revolve on the Barker's mill principle (see HYDRAULICS) at the same time regularly sprinkling the surface of the mash with the water at the desired temperature, which percolates through the whole and absorbs the extract as it passes. This is continued till sufficient water has been run on to produce a wort of proper strength, and remove all



Section of Mashing machine

the available extract from the malt. When the wort is all drained into the copper the hops are now added and the whole boiled for about two hours. (It generally happens that one copperful does not boil all the wort run off the mash tun, in which case the remainder must be boiled separately and mixed afterwards.) When sufficiently boiled the contents of the copper are run into the hop back M, a rectangular vessel say 25 feet long, 6 feet broad, and 8 feet deep, which has a false bottom about 8 or 9 inches from the true bottom. The hot wort runs through the perforations in the false bottom and thence into the cooler N, leaving the spent hops in the hop back. The cooler is a large flat vessel 25 feet square and only 8 inches deep, here the worts are exposed to the air for a certain time. Fanners were much used in coolers long ago, but never now if the brewer can manage without them, as the less exposure cooled

worts have to atmospheric air the better. From the cooler the liquor is admitted to the refrigerator o (shown in position and separately on a larger scale), a shallow rectangular vessel, 10 feet by 6, and constructed of numerous tinned copper pipes through which cold water is made to pass. The hot worts flow from end to end, passing alternately over and under the tubes, which reduces the temperature to almost that of the cold water. A temperature of about 58° is generally what is aimed at. The worts on leaving the refrigerator are led by pipes down into the fermenting tuns r, which are large vessels made of wood. There the yeast or barm is added as soon as the wort begins to run in from the refrigerator, and in these vats or tuns the fermentation is carried on. During the operation the temperature rises considerably, and requires to be kept in check by means of a coil of copper piping having cold water running through it, lowered into the beer. The temperature should not rise above 72°.

It is at this stage that the difference of the Scotch system of brewing from the English begins. In England the worts are only kept in the fermenting tuns for about thirty hours, and are then pumped into a series of casks called unions q, in which the fermentation is finished. In Scotland the fermentation is carried on and completed in the fermenting tuns. The unions are casks suspended on pivots or trunnions by the ends in a double row of perhaps twenty or thirty, having a long trough supported above and between the rows of casks, and connected by means of short pipes from the bottom with the top side of each cask. The casks are also fitted with a U-shaped pipe having one arm much longer than the other, the long end being inserted in the bung-hole, the other and shorter end over the side and into the trough above. These are called swan-necks. In filling the unions the beer is pumped into the trough, runs down by the short tubes into the casks (the displaced air escaping by the swan-necks), and eventually fills all the casks and an inch or so of the trough. The fermentation soon makes itself evident by the barm rising up and flowing into the trough by the swan-neck, while the cask is kept filled up from the trough. This goes on for some days till the barm or yeast has finished its work, when the beer becomes comparatively clear. The casks are then emptied by means of stop-cocks in their lower sides into a trough, and from that by pipes into the settling squares k, which are rectangular wooden tanks, being somewhat shallow and fitted with cold-water pipes so as to cool down the beer. Here the yeast separates, some rising to the top and the rest falling to the bottom. In two or three days the beer should become nearly bright, when it is carefully run off by means of a pipe and filled into the trade casks or pumped into vats.

Of the beers manufactured from grain there are a great many varieties. These have sometimes been all classified under the three heads of *beer*, *ale*, and *porter*, but at the present day this classification will not hold, as *beer*, besides being the general name for all malt liquors, is often applied as the designation of beverages which at other times are called *ale*. Thus the *bitter* *beer* now so largely drunk, is also known as *pale* or *water ale*, and this is a very different kind of beverage from the *ale* known as Scotch *ale*, which is sweet and not bitter, containing a comparatively small quantity of hops. The terms *ale* and *beer* both belong to the early or Anglo-Saxon period of the English language, but in more modern times the term *beer* seems to have been applied more especially to malt liquor flavoured with hops or other bitters, the use of hops being introduced from Germany about 1524.

The term *ale* is generally applied to beverages (whether bitter, sweet, or *mild*, that is, between the two) that are not intended for immediate consumption, but to be kept for a longer or shorter period. The malt for such liquors must be dried very carefully and slowly so as to be of a pale colour; and the heat of the water, when poured on the mash, must be tolerably high. Great care is taken in the selection of the materials and in the whole process of brewing when a high class pale ale is intended to be produced, such as that manufactured in the great Burton breweries. The excellence of the Burton ale depends partly on the water used, which is all drawn from wells, and contains carbonates and sulphates of lime and magnesia in large quantities, and partly on the method of brewing, the fermentation being carried on at a low temperature, and the delicate flavour of the hops thus preserved, and the keeping quality of the beer secured. The bitter beer made for home consumption is less bitter than that which is sent abroad, at least as brewed by the best brewers; but a good part of the beer sold under this name is of poor quality and would have little flavour were it not for the hops.

Porter and *stout* are dark in colour, and are produced by the use of a large proportion of highly dried malt along with a certain proportion of chocolate malt. The mashing heats used are much lower than in the case of pale ales, and a smaller proportion of hops is added, but otherwise the process of manufacture is much the same. In the case of stouts, they are allowed to mature by going through a long, slow, secondary fermentation in large vats so as to produce the characteristic flavour of this class of malt liquor. London and Dublin are both renowned for the quality of the stouts they produce.

German Beer or Lagerbier.—The latter name is really a misnomer when applied to all classes of German beer, for in Germany and Austria the same difference is made between draught beer (*Schenkbier*) and stored beer (*Lagerbier*) as elsewhere. In the preparation of the malt for the different classes of beers very much the same procedure is followed as already described, with this exception, that, whereas in all kilns in the United Kingdom the furnace gases are allowed to pass through the malt during the drying process, in German kilns only heated air is employed. This, as may readily be supposed, has a great influence on the character of the resultant beer. The beers brewed in Germany and Austria may be roughly divided into three classes:—1. Beers of the Pilsener type—so called from Pilsen in Bohemia, where the original beer was and is brewed—which are pale, dry beers possessing a vinous flavour. 2. Bavarian beers, dark in colour and full and sweet in flavour, of which class the Munich beers are the most famous. 3. Vienna beers, which stand midway between the two previous types. The processes in brewing those different beers are, however, so much alike that they may be treated as one.

The first great difference between German and English methods of brewing is met with in the mashing process. In Germany the ground malt is run into the mash-tun along with cold water, and the two are thoroughly mixed in the usual way. After this, portions (usually two or three) of the mash are successively run into a copper, and are slowly heated to boiling, whereupon they are returned to the remainder of the mash in the tun, thereby raising the whole more or less rapidly to the desired mashing temperature. After standing for some time the wort is drained off in the usual way and boiled with hops, of which a much smaller quantity is employed than in the case of British beers. The hot wort is cooled

down to about 41° F. and fermented at 41°-50° F. in fermenting rooms, which are kept cool by means of cold brine circulated through pipes fixed to the roof. The fermentation is usually finished in eight to ten days, when the beer is run off into large stout casks, which are kept in cellars cooled to the freezing-point by means of brine pipes. Here the beer lies for weeks or months passing through a very slow fermentation, during which it becomes quite clear and absorbs a large quantity of carbonic acid gas. It is then run into the trade casks or is bottled for use. The yeast used in producing lager beer is what is technically known as 'bottom-yeast'—i.e. at the end of the primary fermentation it is found in a compact layer at the bottom of the tun after the beer has been run off—in contradistinction to the 'top-yeast' of British beers, which rises as a thick scum to the surface of the fermenting wort.

Malt substitutes.—Instead of using only malt in the preparation of beer it may be partly replaced by other forms of starch in the mash-tun or by various sugars in the wort copper. Rice and maize are much used, either prepared so that they may be at once added to the mash, or raw, when their starch must be gelatinized by heat before use. Barley and even oat starch may also be used.

Hop substitutes are not used by any firm with any reputation to lose. There is no substance known which can replace hops in all their functions.

BREWSTER, SIR DAVID, one of our most learned natural philosophers, was born at Jedburgh, Dec. 11, 1781. He was originally intended for the church, and with that view entered the University of Edinburgh, where, however, the lectures of Robison and Playfair attracted him to scientific pursuits. His first investigations were on the subject of the polarization of light, upon which he communicated some important observations to the *Transactions of the Royal Society of Edinburgh*. In 1808 he became editor of the *Edinburgh Encyclopedia*, to which he contributed a number of valuable articles. In 1816, while repeating the experiments of Biot on the action of fluids on light, he made those observations which resulted in the invention of the kaleidoscope. In 1819, in conjunction with Jameson, he founded the *Edinburgh Philosophical Journal*, of which he was sole editor from 1824-32. Brewster was one of the leaders among those men of science who founded the British Association, the first meeting of which was held at York in 1831, and he presided over it on the occasion of its twentieth meeting, which was held at Edinburgh in 1850. In 1832 he received the honour of knighthood along with a pension from the government. Both before and after this time his services to science obtained from many quarters the most honourable recognition. The French Institute, of which he had been a corresponding member since 1825, appointed him one of its eight foreign associates on the 4th of Jan. 1849, and he was also among the members of the Academies of St. Petersburg, Berlin, Vienna, Stockholm, and Copenhagen. From Prussia he received the Order of Merit in 1847, and in 1855 the cross of an officer of the Legion of Honour was bestowed on him by Napoleon III. From 1838 to 1859 he was principal of the united colleges of St. Leonard's and St. Salvador at St. Andrews, and in the latter year he was unanimously chosen principal of the University of Edinburgh—an office which he continued to hold till his death, which took place at his seat of Allerty, near Melrose, Feb. 10, 1868. The chief works of Brewster are, a *Treatise on the Kaleidoscope*; *Letters and Life of Euler*; *Letters on Natural Magic*, dedicated to Sir Walter Scott; *Treatise on Optics*; *Martyrs of Science*. More Worlds than One; *Memoirs of the Life, Writings,*

and Discoveries of Sir Isaac Newton (Edin. 1855); an enlarged edition of his *Life of Newton*, which originally appeared as the twenty-fourth volume of Murray's Family Library; besides numerous communications to the Royal Societies of London and Edinburgh, contributions to the *Encyclopedia Britannica*, the *Edinburgh* and *North British Reviews*, and other periodicals.

BRIAN (surnamed *Boromhó* or *Bori*) figures in early Irish annals as a celebrated chieftain, and son of Kennedy, king of Munster. He succeeded to both Munsters, nearly identical with counties Tipperary and Clare, in 978. Having defeated the Danes of Limerick and Waterford, he turned his arms against O'Macalachlain, or Malachi, who had a nominal supremacy over the whole island, and became king in his stead, levying tribute, or *boromhó*, from which circumstance he derived his surname from the rulers of all the different provinces. He distinguished himself as much in peace as in war, contributed greatly to the progress of civilization, and made many internal improvements. He fell in 1014, after gaining a signal victory over the Danes, who had leagued with a revolted chief called MacLomra.

BRIANÇON (*Brigantium*), a town, France, in the department of Hautes Alpes, on the right bank of the Durance, 35 miles N.E. from Gap, and near the Italian frontier. It is a fortress of the first class, occupying an eminence at the foot of the Col de Genève, 4284 feet above sea-level, and has sometimes been called the Gibraltar of the Alps, forming a central point from which troops can be marched to all their most important passes. Briançon is a town of great antiquity. According to Pliny it was founded by the Greeks. Pop. (1891), 3638.

BRIANSK, a town, Russia, government of, and 70 miles W.N.W. from Orel, on the right bank of the Desna. It is surrounded with an earthen rampart, contains sixteen churches, a monastery, with a seminary, and two poorhouses, and has a considerable trade in grain, hemp, hemp-oil (sent to St. Petersburg and Niga), honey, and wax; and in linen, cable, and cordage, ironware, bark, mats, lime, and tar, which are sent to Kherson, Odessa, and other parts of the Black Sea. It contains imperial building-yards, for which the oak forests in the neighbourhood supply material. Near it are a cannon-foundry and a manufactory of small arms. Pop. (1892), 20,592.

BRIAREUS (also called *Egeon*), a giant with 100 arms and fifty heads, the son of Uranus and Terra (Gaia). His two brothers, Cottus and Gyges, were formed in a similar manner, and their formidable appearance struck their father with such terror, that he imprisoned them at their birth in the bowels of the earth (Hes. Theog. 147). In the war with the Titans Jupiter (Zeus) set them free, and by their assistance gained the victory. When Juno, Neptune, and Minerva conspired to bind the sovereign of the gods, Thetis brought Briareus from the depths of the sea (how he came there is not known) to the relief of the trembling Jove (Il. a. 402). Virgil places Briareus in the vestibule of hell (*Æn.* vi. 287). He was employed with his hundred-handed brothers (*Centimani*) in watching the Titans in Tartarus (Hes. Theog. 734). Various other fables are told of these gods, who are supposed to be personifications of the extraordinary phenomena of nature manifested in volcanoes, earthquakes, and other commotions.

BRIBE, a reward given to a public officer or functionary, to induce him to violate his official duty for the benefit or in compliance with the wishes of the party by whom or on whose behalf the bribe is given or promised. The term *brutery* is applicable alike both to the receiving and to the giving of the reward. A corrupt bargain for the votes of electors in the choice

of persons to places of trust under the government is bribery. In this instance the electors, as such, are a kind of public functionaries. To prevent the practice of bribery and intimidation at parliamentary elections the Ballot Act was passed in 1872, but bribery was more directly aimed at by the Corrupt Practices Act of 1883, which renders a person convicted of treating, bribery, personation, and undue influence, liable to fine or imprisonment with hard labour. Money or almost any valuable consideration given or promised to electors before, during, or after an election may be construed into bribery, and the legal expenditure of candidates on an election is brought within fixed limits. According to the degree of his offence a candidate found guilty under this act may be debarred from ever sitting for the particular constituency, or from sitting in the House of Commons for seven years, and all guilty persons may be declared incapable of holding a public office or exercising any franchise. By an act passed in 1884 persons guilty of bribery and corrupt practices at municipal elections are rendered liable to the same punishment and disabilities as offenders at parliamentary elections. Particular species of bribery are expressly forbidden, with penalties, by the positive laws of most states. The corrupt discharge of a public trust, in consideration of bribery, is punishable at common law, though not prohibited by any positive statute. An attempt to influence jurymen in giving their verdict by rewards is a species of bribery denominated *embracery* (which see). The British laws and those of America specially prohibit bribery of the officers of the revenue; and the forfeiture, on the part of the offender offering a bribe to an excise officer, in Britain is £500; the officer receiving the bribe incurs the like forfeiture, and is disqualified for public employment, civil or military. In the Customs Consolidation Act of 1859 it is laid down that a person who bribes, or offers to bribe, or enters into any corrupt arrangement with, an officer of customs or excise to make him in any way to neglect his duty is liable to a forfeiture of £200. The laws of many of the United States contain special provisions against bribery of judges or jurymen, or of electors in the choice of public officers.

BRICK is a sort of artificial stone, made principally of some sort of clay, shaped in moulds, and either dried in the sun or baked by burning. Unburned bricks are found in the Roman and Grecian monuments, and far older ones in abundance in the ruins of Egypt and Babylon. They were mixed with chopped straw to give them tenacity. On account of the heat and dryness of the climate they acquired a great hardness, and have lasted for several thousand years, but unburned bricks are unsuitable for more northern latitudes, though still used in Egypt, Persia, Mexico, and elsewhere. Burned bricks were also used at a very early period. They are mentioned in the book of Genesis in connection with the building of the Tower of Babel. The Romans made extensive use of burned bricks, the most common size being 17 inches long and 11 broad. In England bricks of this size were afterwards superseded by the smaller Flemish brick, and now the standard or usual size of bricks made in Britain is about 8½ inches long, 4½ inches broad, and 2½ to 3½ inches thick; in America they are generally rather smaller. Their red colour is owing to the presence of oxide of iron, which is turned red by burning. The best season for making them is spring or autumn, since the process of drying then takes place more gradually and equably. The clay should be dug in autumn, and exposed to the influence of frost and rain. It should be worked over repeatedly with the spade,

and not made into bricks until the ensuing spring. The clay may have too great or too small a proportion of argillaceous earth or of sand to form a paste of proper consistency; it will then be necessary to add the one or the other, as the case may be. When the mass has thus been thoroughly mixed, the moulder throws it into the mould, presses it down till it fills all the cavity, and removes the overplus with a stick. The bricks are then arranged on *backs* to dry, disposed diagonally, to allow a free passage to the air. In about nine or ten days they are ready for the burning, for which purpose they are formed into *clamps* or placed in *kilns*, having flues or cavities at the bottom for the insertion of the fuel, and interstices between them for the fire and hot air to penetrate. A fire is kindled in these cavities, and gradually increased for the first twelve hours, after which it is kept at a uniform height for several days and nights, till the bricks are sufficiently burned. Much care is necessary in regulating the fire, since too much heat vitrifies the bricks, and too little leaves them soft and friable. Bricks are now largely made by machines. The clay, according to one process, is mixed and comminuted in a cylindrical pug-mill, as it is called, by means of rotatory knives or cutters working spirally, and pressing the clay down to the bottom of the cylinder, where it is discharged in a tempered state. Machines are also used for moulding the bricks, and for making perforated bricks and hollow bricks, which are used when great lightness is required. Machine-made bricks are heavier, being less porous, than hand-made bricks, and are more liable to crack in drying; but they are smoother, and, when carefully dried, stronger than the hand-made. Hand-made bricks have an indentation on one side, known as a *frog*, which serves both to lighten the brick and to form a key for the mortar. In those machine-made bricks which are separated during manufacture by means of a wire there is no frog, but in pressed machine-bricks a frog is usually found. *Floating-bricks* are so called on account of their property of swimming on the water. They are made of argill mineral or fossil farina, which is found in some parts of Europe. Their infusibility at the highest temperatures renders them useful in constructing reverberatory furnaces, pyrometers, and magazines of combustible materials. Their lightness and non-conducting property render them particularly useful for the construction of powder-magazines on board of ships. *Fire-bricks*, for building furnaces, &c., are made of a clay which, when properly prepared, is capable of resisting great heat. They are baked at an intense heat. The clay of which they are made contains more silica in combination with alumina than common brick clay. There are various kinds of white bricks, such as the Suffolk and Deaulieu varieties, made from special clays mixed with much chalk. The blue bricks of Staffordshire owe their colour to a dark oxide of iron; and white enamelled bricks are in general use for lavatories and various other purposes. Until 1850 there was a duty on the manufacture of bricks in Great Britain.

BRIDE, *St.* See BRIDGE.

BRIDEWELL, formerly a famous house of correction in Blackfriars, London. The name originally belonged to a well dedicated to St. Bride. Henry VIII. built on this site, in 1522, a palace for the accommodation of the Emperor Charles V., which became a residence of Wolsey, and under Edward VI. was in 1553 converted into a workhouse for the poor, and a house of correction for the idle and vicious. Prisoners here were made to work during their confinement, as in most other houses of correction; but from this being one of the earliest of

the houses of correction there originated the generic term, a *bridewell*—a house of correction. It was governed by a keeper who was independent of the sheriff of London.

BRIDGE. It is needless to investigate ancient authors for a description of the primitive bridge, as its origin and elements are to be found in uncultivated nations of modern times. Stepping-stones in shallow rivers, covered with planks from stone to stone, exhibit the incipient principles of piers and arches which science has brought to their present perfection. In deeper rivers an accumulation of stones would form a loftier pier; and where the openings were sufficiently narrow, and the slabs of stone sufficiently long, or the art and strength of the untaught architect sufficient to the task, a stone roadway was formed from pier to pier. Among most of the nations of antiquity the arch appears to have been unknown. Even the Greeks had not apparently sufficient acquaintance with it to apply it to bridge building. No vestige of a bridge occurs in Greece belonging to the period before its occupation by the Romans. No people of the ancient world carried the power of rearing the stupendous arch and the magnificent dome to such an extent as the Romans, who are supposed, however, to have derived their first knowledge of the art from the Etruscans, to whom probably it came from Greece. After the construction of the great sewers and aqueducts at Rome, a bridge over the Tiber was of easy execution; and in the construction of stone bridges in the best and substantial manner, the highest rank must be conceded to this great and indefatigable people. The bridges of ancient Rome were eight in number. One or two of them are still standing; the *Ponte Fabricio*, built B.C. 62, being the oldest. One of the finest Roman examples was the bridge built by Augustus over the Narni, the vestiges of which still remain. It consisted of four arches, the longest of 142 feet span and over 100 feet in height. A still more remarkable bridge, built by Trajan over the Danube, was destroyed by his successor Hadrian. The most celebrated bridges of the Romans were not generally, however, distinguished by the extraordinary size of their arches, nor the peculiar lightness of their piers, but by their excellence and durability. The span or chord of their arches seldom exceeded 70 or 80 feet, and the versed sine or height was nearly half of the chord, so that they were mostly semicircular, or constituted a segment nearly of that form.

Among the most celebrated bridges built subsequently to the destruction of the Roman Empire are those of the Moors in Spain, who imitated and rivalled the best constructions of the Romans. The bridge of Cordova, over the Guadalquivir, is an eminent example of their success. The bridge over the Rhone, at Avignon, begun in 1176, and now represented by a picturesque fragment, is one of the most ancient bridges of modern Europe. It was built by a society or order called the *Frères Pontiers*, or *brethren of the bridge*. It was composed of nineteen arches. The length of the chord of the largest was 110 feet 9 inches, and its height 45 feet 10 inches. Of the nations of modern Europe the French were among the first to carry the art of bridge-making to its present perfection. The constructions of Perronet, who was chief engineer of bridges and highways in France under Louis XV. and XVI., have never been surpassed. Among them were the bridges of Nogent-sur-Seine (1768-69); Neuilly (1768-74); Louis XVI., at Paris (1787-92). The bridge at Neuilly consists of five arches, each 128 feet span, and 82 feet rise.

In Great Britain the art of building bridges ap-

pears to have been introduced by the Romans. The most ancient bridge in England is said to be the Gothic triangular, or rather three-way, bridge at Croyland or Crowland, in Lincolnshire, which is said to have been built in 860, but the present work is much later. It originally spanned three water-courses, and is so steep that none but foot-passengers can go over it. The longest old bridge in England was that over the Trent at Burton, in Staffordshire, built in the twelfth century, of squared freestone. It consisted of thirty-six arches, and was 1645 feet long. It was pulled down only in recent times. Old London Bridge was commenced in 1176, and finished in 1209. It was built on each side with houses like a regular street till 1756-58. In 1831 it was altogether removed, the present bridge, which had been begun in 1824, having then been finished. It consists of five elliptical arches, of which the centre arch has 162 feet span, with a rise of 294 feet above high-water mark. The two arches next the centre are 140 feet span, with 27½ feet rise. The total length of the bridge is 1005 feet, and the roadway is 53 feet wide between the parapets. It was erected, after designs of the elder John Rennie, by his son Sir John Rennie, and cost less than half a million. Waterloo Bridge, London, is generally considered one of the finest and handsomest stone bridges yet built. The architect was the elder John Rennie, and the bridge was completed in 1817. The material of the bridge is Aberdeen granite, and it consists of nine elliptical arches of 120 feet span, with a rise of 32 feet, the total length, including the approaches, being 2456 feet. The width between the parapets is 414 feet. The roadway is almost perfectly horizontal, and the bridge was one of the first in which this construction was adopted. Other English bridges of importance are the Chester Bridge (Grosvenor Bridge, 1826), consisting of one arch 200 feet in span, one of the largest stone archways yet constructed; the Royal Border Bridge (railway), Berwick, 2160 feet long, with twenty-eight arches, designed by Robert Stephenson; the Congleton Viaduct on the railway from Manchester to Birmingham, 2870 feet long, with forty-one arches; the Tyne Viaduct, 902 feet, with four arches, &c.

There are very few bridges of notable antiquity in Scotland. One of the oldest is the bridge over the Don, near Aberdeen, called the Brig of Balgownie, said to have been built by Bishop Cheyne in 1281. It consists of one large Gothic arch of 67 feet span. The bridge at Perth is a handsome structure, designed by Smeaton, finished in 1772, and replacing an old bridge swept off by an overflow of the river more than a century before. The bridge of Tongue-land, near Kirkcudbright, over the Dee, consists of one arch of 112 feet span. Union Bridge, Aberdeen, built in 1800-1803 from Telford's designs, has an arch of 132 feet span, with 29 feet of rise. Dunkeld Bridge, a noble structure built in 1805-1809, from designs by Telford, has five large arches, and two smaller, the middle arch being 90 feet span. The Dean Bridge, Edinburgh, is a beautiful structure of 1832 (by Telford), remarkable for its situation and height. It crosses the deep ravine formed by the stream called the Water of Leith, a little above St. Bernard's Well. It is 447 feet in length, 39 feet in breadth, and 106 feet from the roadway to the bed of the river. At Glasgow there are two stone bridges, of modern construction and remarkable solidity and beauty spanning the Clyde, and connecting the southern with the northern division of that city. One of these was finished in 1854; the other, designed by Telford, called the Broomielaw bridge, was erected in 1833-38, but has recently been taken down and rebuilt, being now widened to 80 feet, or 20 more

than before. The arches (as before) are segments of circles, seven in number, the span of the centre arch being 57 feet 9 inches, and the length of the bridge about 560 feet. The Ballochmyle viaduct, by means of which the Glasgow and South-Western Railway crosses the river Ayr, has a central semi-circular arch of 180 feet span, the largest span of any railway stone bridge.

Comparatively few large stone bridges are found in America; but a bridge constructed in 1861, to carry the Washington aqueduct over Cabin John Creek, has a stone arch of 220 feet span, the greatest in existence.

Iron Bridges are the invention of British engineers, and as they possess many advantages they have become very common, though cast-iron has been generally given up for wrought iron and steel. The first bridge of cast-iron ever erected was that over the Severn, about 2 miles below Coalbrookdale, in Shropshire. It is an arch composed of five ribs, forming the segment of a circle. Its chord is 100 feet long, and its height 45 feet. It was erected in 1779. Near it there is a more recent iron bridge of greater span (200 feet), designed by Sir John Fowler for the railway here. The bold and elegant cast-iron bridge over the Wear at Sunderland was opened in 1796, and widened by Robert Stephenson in 1858-59. It is formed of a single arch of 236 feet span and 34 feet rise, composed of six ribs. The height above low water is about 100 feet. Close to it there is a more recent single-arch iron bridge. Westminster Bridge, over the Thames (opened in 1862), consists of seven low arches of wrought and cast iron, supported on piers of solid granite, and is no less than 85 feet wide. Blackfriars Bridge, London (opened in 1869), consists of five arches of wrought-iron, of which the centre arch is 185 feet in span, with its summit 25 feet above high water. The width between the parapets is 75 feet, the roadway in the centre being 45. In front of the piers there are short massive columns of polished red granite, with carved capitals of Portland stone. The Southwark Bridge (opened in 1819), over the Thames at London, designed and constructed by the elder Rennie, consists of three arches, the span of the middle arch being 240 feet long, and its height 24 feet. One of the most celebrated of metal bridges is the High-level Bridge across the Tyne at Newcastle. It is a double bridge, resting on six massive stone piers, the piers supporting both an ordinary carriage road, with footpaths, and a railway, placed 25 feet above the former. It was designed by Robert Stephenson and Mr. T. E. Harrison, and was opened in 1849. The loftiest railway bridge in England is the Crumlin Viaduct (see accompanying plate), in Monmouthshire, constructed in 1853-57. It crosses a mountain gorge at a height of about 210 feet, and consists of ten spans of 150 feet. The cast-iron piers are strengthened by diagonal braces. Robert Stephenson's Britannia Tubular Bridge, across the Menai Strait, opened in 1850, was one of the greatest triumphs of modern engineering science. Consisting of great wrought-iron tubes, through which the railway trains run, it introduced a new method of iron bridge-building. Its construction is described below, and it is illustrated in the accompanying plate. Wrought-iron girder bridges followed, and latterly, especially those on the lattice-girder principle, have become exceedingly common. The girder bridge across the Firth of Tay at Dundee was opened in 1887, is 2 miles 73 yards long, has 85 spans, is 77 feet high in four of the mid-spans, and carries two lines of rails. It was built to take the place of a similar bridge that had not stood long when a great part of it was blown down in a storm, while a train was crossing, in the end of 1879. The cantilever

principle in bridge-building is best exemplified in the great bridge over the Firth of Forth at Queensferry completed in 1889. It has two chief spans of 1710 feet, two others of 680 feet, fifteen of 168 feet, seven small arches, and affords a clear headway for navigation purposes of 150 feet above high-water spring-tides. The great spans consist of a cantilever at either end 680 feet long, and a central girder of 350 feet. Both these bridges were built for the line of the North British Railway. A separate article is devoted to the Forth Bridge.

American engineers have been very successful as iron bridge-builders, adopting various forms of girder, and constructing also some splendid bridges with arches of great span built up of wrought-iron and steel. Some important bridges in the Eastern Hemisphere have been constructed by Americans with materials sent from their own works in America.

Timber Bridges.—The oldest bridges on record were built of wood. The Sublucian Bridge at Rome, famous for the defence of Horatius Coclès against the army of Porsena, must, according to the Roman legend, have been destroyed about 500 B.C.; but a Sublucian Bridge was in existence many centuries after this. Another celebrated wooden bridge was that thrown by Julius Cæsar across the Rhine, as described in his Commentaries. Germany was the school for wooden bridges, as Britain for those of iron. Perhaps the most celebrated of all wooden bridges was that which spanned the Rhine at Schaffhausen in Switzerland. This had a span of 384 feet, and was 18 feet broad. It was designed and executed by J. Ulric Grubemann, a village carpenter of Teuffen, in 1758, and was destroyed by the French in 1799. In the United States of America there are many fine specimens of timber bridges. That built by Theodore Burr at Waterford, New York, in 1804, is the oldest bridge now standing in the United States. It is made of hewn yellow pine, and consists of four spans, the largest being 180 feet. A year later Timothy Palmer built a bridge of three spans across the Delaware, at Easton, Pa.; this is also still in use. **Trestle bridges**, or bridges the roadway of which is supported on wooden trestles or frames, formed of a series of beams and braces, are common in America.

Movable Bridges are of various kinds. The bascule or drawbridge—in which the roadway may be raised and lowered in one or two pieces—is a common form; and there are also swing bridges—opening horizontally to let shipping pass—bridges constructed so as to roll horizontally on wheels or otherwise, bridges in which the movable part carrying the traffic is suspended from a high iron framework, under which shipping passes; &c. Of these the swing bridge is the commonest. Pontoon or floating bridges are formed of boats laid over with planks. A flying bridge is simply a sort of ferry. The Tower Bridge, London, is partly on the bascule principle (see below).

Suspension Bridges of iron are comparatively a modern invention, though hanging bridges of other materials, as the rope bridges of South America and the East Indies, have long been in use. The earliest chain bridge is said to have been one thrown across the Tees in 1741. It was about 60 feet wide, and had chains at either end to help to steady it. Various iron suspension bridges were constructed early in the nineteenth century; but the first really great structure of the kind was the suspension bridge constructed by Telford over the Menai Strait, between the Isle of Anglesey and Caernarvonshire in Wales. It was finished in 1825. The roadway is 100 feet above the surface of the water at high tide. The opening between the points of suspension is 580 feet. Some details of its construction are given

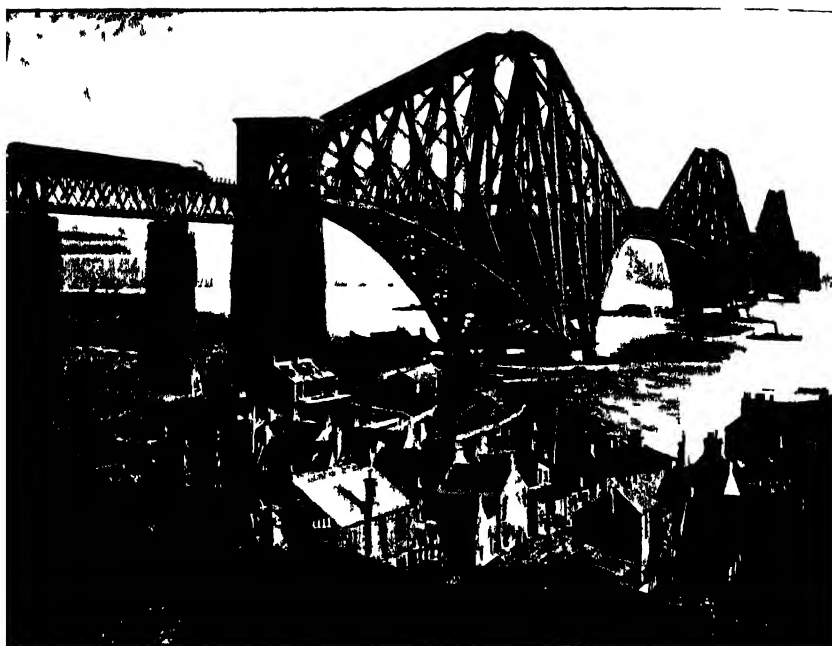
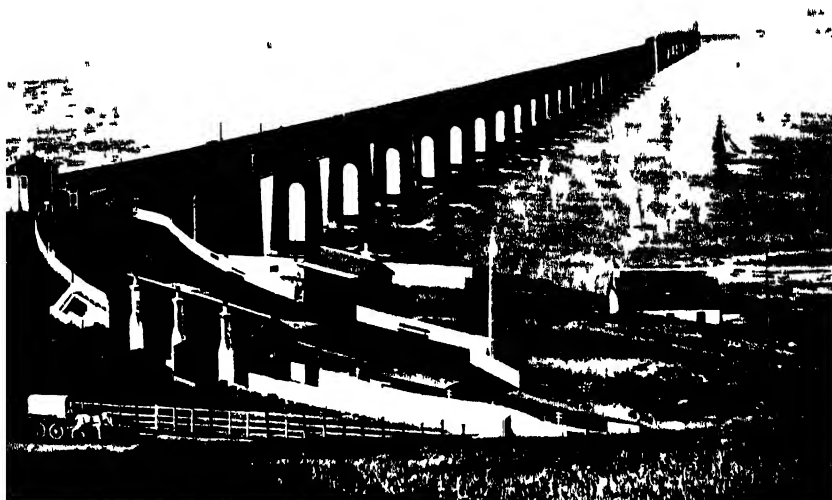


Fig. 1. Forth Bridge, from North Queensferry (from a photograph by J. Tait & Co., Edinburgh).



below. There are many other suspension bridges in Great Britain. The Union Suspension Bridge near Berwick is 449 feet long. The suspension bridge over the Avon at Clifton is 702 feet in length, and 245 feet above high-water mark. The Freiburg Suspension Bridge in Switzerland is 880 feet long; that over the Danube at Budapest is 666 feet. In the United States such bridges are also common. The railway suspension bridge over the Niagara, supported by wire cables, is 822 feet long; the platform, which carries three lines of rails, being 245 feet above the river. Another bridge, 7 miles below the falls, has a span of 1040 feet. A suspension bridge of great magnitude, connecting the city of New York with Brooklyn, was opened in 1883. The central or main span is 1595½ feet from tower to tower, and the land spans between the towers and the anchorages 930 feet each; the approach on the New York side is 2492 feet long, and that on the Brooklyn side 1901 feet, making the total length 5989 feet. The height of the platform at the centre is 135 feet above high water, and at the ends 119 feet. The roadway is 85 feet broad and is divided into five sections, the two outside for vehicles, the two inner for tram-cars, and the middle one, 12 feet above the rest, for foot passengers. (See the plate.)

Construction of Bridges.—The theory of stone bridges involves mathematical demonstrations and calculations of great complexity; the properties of the arch, the thickness of the piers, and the force of the water form separate elements in the computations. The arch is a series of wedge-formed bodies cemented together and rendered coherent by mutual pressure, the first and last being sustained by a support or abutment. The centre arch-stone or *vousoir* (a French term) is the highest part or crown of the arch, and is called the *keystone*. The interior surface of the arch is called the *intrados*, the part immediately under the keystone is called the *soffit*, the remaining portions the *flanks*. The term *soffit*, however, is sometimes used synonymously with *intrados*. The exterior surface is called the *extrados*, or back of the arch. The points of junction between the flanks and the abutments are called the *springings*; the distance between them horizontally is the *span*; the perpendicular from the soffit to a straight line drawn between them is called the *rise*, or height of the arch (See ARCHITECTURE). It has been found that in the construction of an arch the slipping of the stones upon one another is prevented by their mutual pressure and the friction of their surfaces; the use of cement is thus subordinate to the principle of construction in contributing to the strength and maintenance of the fabric. The line of resistance of the materials forming any structure, whether straight or curved, being capable of geometrical calculation, it can be determined beforehand whether this line will fall within or intersect each successive joint of the structure; if it does, the mass will not be liable to turn over on the edge of any particular joint. By a more exact calculation of the line of resistance, even the slipping of one joint upon another can be obviated by the form of the structure. This is called determining the line of pressure. Upon these two lines the equilibrium of the structure depends. The lines of pressure and resistance in the arch of a bridge are calculated so as to pass into the abutments or piers, where they take a new direction; the strength of the abutments or piers, and the amount and direction of the strain upon them, being calculated by the architect so as to render them capable of permanently supporting the fabric. When the pressure upon an arch causes it to give way, it breaks into four parts, the stones turning inwards upon their superior edge at the

crown, and outwards on their inferior edge at two points in the haunches where the line of resistance reaches the interior edge and which are called the points of rupture. The ancients, being unacquainted with the full theory of the arch, usually made their arches more numerous, of smaller span, and with stronger piers than are found necessary in modern structures. Another advantage which the modern architect of bridges has over the ancient, is in the invention of the cofferdam. This is a water-tight case made to protect the middle piers of a bridge, by driving piles down to the solid foundation, and filling them up with clay or other impermeable material (see COFFERDAM), so as effectually to exclude the water. In constructing a bridge, it is desirable to have the smallest possible number of points of support. Piers in the water way are not only expensive to form, but obstruct the navigation of the river. London Bridge is represented as a model in this respect, the width of its arches and the lightness of its piers offering the least possible obstruction to the navigation. When the water-way is obstructed the bridge itself is exposed to danger, the wearing action of the water sometimes undermining the piers on which it rests. The pier, at the point where it supports the arch, is usually oblong in form, and increases in breadth to the foundation. The rate of increase in modern bridges is frequently 8 inches to the foot. The ends of piers are provided with salient angles to act as cutwaters; the form of these differs according to circumstances. In building the arch of a bridge, a timber framework is used called a *centre*, or *centering*. The centering has to keep the stones or voussoirs in position till they are *keyed in*, that is, fixed by the completion of the central part; its construction is a matter demanding the utmost care of the architect. On removing this framework, which is called striking the centre, what is called the settlement of the arch takes place, the central voussoirs move slightly downwards, while a corresponding rise takes place in the flanks. Before striking the centre of the bridge of Nogent-sur-Seine, Perronet caused three lines to be cut, one horizontally over the crown, and two obliquely from the extremities of this line to the springings. On the striking of the centre these lines were found to have altered their forms and relative positions. From straight lines they had become curves. The horizontal line had sunk, and its greatest deflection was above the key, while the oblique lines from the springings were deflected upwards. The *spandrels* of a bridge are the spaces between the haunches of the arch and the point of junction of the extrados with the roadway. These are frequently filled up with rubble-work or gravel. They are sometimes left open to give greater lightness to the structure. The former plan has been generally adopted in the large French bridges; the latter was recommended by Telford. Owing to the superior skill of modern engineering, the roadway of bridges is made much wider and more level than was previously attainable.

Suspension bridges are much lighter than stone bridges, and being entirely independent of central supports, do not interfere with the river, and of course are not liable to be affected by currents or by floods. The entire weight of a suspension bridge rests upon its piers, from which it is suspended freely at an elevation above the level of the pressure. Hence the bridge rights itself after a temporary displacement with a vibratory movement which imparts a peculiar sensation to the passenger. The modes of constructing and suspending these bridges are various, and our space will not permit us to enter into details regarding them. One of the most remark-

able of these bridges, both for dimensions and situation—the Menai suspension bridge already referred to—has the suspending chains formed of straight iron bars united by coupling bolts. The main chains are sixteen in number, disposed four chains one under the other on each side of the central footpath, and four at each side of the platform of the bridge. The chains have their extremities fixed firmly in the solid rock on either side of the strait, tunnels being cut for some distance in the rock, and the extreme ends fastened by strong holding bolts in chambers made at the ends of the tunnels. On the top of the piers or towers of the bridge the chains lie loosely upon cast-iron saddles, laid upon horizontal rollers or trucks that lie in grooves or channels formed in a cast-iron platform on the summit. The saddles can move backwards and forwards a few inches in the direction of the length of the bridge, and thus expansion and contraction of the chains produce no other effect than to move the saddles as they lengthen or shorten, raising or depressing the roadway a little without producing an injurious strain on the materials. The chains were formed link by link working from the fastenings in the tunnels at the extreme ends. They were gradually increased in length and brought up over the top of the towers with a loose portion hanging down. The piece of chain that was to unite the two loose ends was then floated on a raft, and being attached to one end was by means of powerful tackles and capstans attached to the other. Some engineers prefer wire ropes to chains in the construction of suspension bridges. The use of iron in the formation of bridges, as already stated, is a modern invention, by which greater strength is secured, in proportion to the weight of the material employed. The earliest iron bridges were erected in the form of arches, and the material, as has been stated, was cast-iron, but the arch has now been generally superseded by the beam or girder, with its numerous modifications; and wrought-iron is likewise found to be much better adapted for resisting a great tensile strain than cast-metal. The greater cohesion and adaptability of the material give more liberty to the architect, and both in suspension and in arched bridges of iron much greater width of span is possible than in arched bridges of stone. None of the modifications of the beam or girder is more interesting than the tubular or hollow girder, rendered so famous from its employment by Robert Stephenson, in the construction of the great railway bridge across the Menai Straits. A view of this bridge is given in our plate. The Britannia Tubular Bridge, so called from the Britannia Rock on which its central pier rests, carries the railway to Holyhead across the Menai Straits, and is situated about a mile from Telford's suspension bridge. Stephenson's original intention was to have constructed an arched bridge of cast-iron, but this idea was given up owing to the condition imposed by the lords of the admiralty, that the height from the level of the water to the springing of the arches should be not less than 105 feet, in order that there should be no interference with shipping. The tubes are rectangular and constructed of riveted plates of wrought-iron. The bridge consists of two of these enormous tubes, laid side by side, one for the up and the other for the down traffic of the railway, and extending each to about a quarter of a mile in length. In point of fact, however, each tube is divided into four parts, which are joined end to end at the piers. The bridge consists of four spans, two principal spans of 460 feet each, over the water, and two smaller ones of 230 feet each, over the land. The Conway Bridge over the river Conway is identical in principle with the Britannia Bridge, but on

a smaller scale. The tubular railway bridge across the Damlatta branch of the Nile has this peculiarity, that the roadway is carried above instead of through the tubes. The Victoria Bridge over the St. Lawrence at Montreal, completed in 1860, as a tubular bridge was even more remarkable than the Britannia Bridge, being nearly 2 miles in length. The upper portion has recently been reconstructed and the tubes removed in favour of open railway tracks. The Forth Bridge is constructed on a somewhat novel principle, that of the cantilever. The Tower Bridge, London, is also of novel design. It consists of a suspension and a bascule bridge combined, and has three spans. Two massive towers support the suspension chains and contain machinery for working the bascule portion which forms the central span of 200 feet. This is in separate halves, which are drawn up flush with the towers when a vessel passes. Above is a footway at the height of 140 feet which passengers reach by means of lifts and stairs when the bascule is not available.

BRIDGENORTH, or **BRIDGNORTH**, a municipal borough and market-town of England in Shropshire, 19 miles S.W. from Shrewsbury, on the Severn, which divides it into two portions, called the High Town and the Low Town, connected by a handsome bridge of six arches. The High Town is about 200 feet above the river. The principal edifices are St. Leonard's Church, a fine old building, latterly restored; St. Mary Magdalene's, built in 1792; the town-hall, the agricultural hall, with its large concert-room, and the public buildings and institute. The principal manufacture is carpeting. The town was a parliamentary borough from the time of Edward I. till it was merged in the county in 1885. Pop. in 1881, 5885; in 1891, 5865; in 1901, 6049.

BRIDGEPORT, a city and seaport of Connecticut, U.S., 58 miles N.W. of New York, on an arm of Long Island Sound. Bridgeport has a large coasting trade, and a number of vessels engaged in whale-fisheries, but is chiefly supported by its manufactures, including large sewing-machine factories. The city is handsomely laid out and beautifully shaded with trees, and has fine public parks. There is daily steamboat communication with New York. Pop. in 1870, 18,969; in 1890, 48,866; in 1900, 70,996.

BRIDGET, the name of two saints in the Roman Catholic Church.—The first, better known as **ST. BRIDE**, was a native of Ireland, and born at Fochard, in the county of Armagh, in the end of the fifth or beginning of the sixth century. She was exceedingly beautiful, and to avoid the offers of marriage and other temptations to which this worldly advantage exposed her, implored God to render her ugly. The prayer was granted, and retiring from the world Bridget built herself a cell under a large oak, hence the name Kill-dara or Kildare, the cell of the oak. Hither she was followed by numerous other virgins, and an order of nuns was established, which spread into different countries, and flourished for centuries. St. Bride is one of the chief Irish saints, and was held in great reverence in Scotland.—The second **ST. BRIDGET**, or more properly **Birgit** or **Brigitte**, was the daughter of a Swedish prince, born about 1302, and died at Rome in 1373, on her return from a pilgrimage to Palestine. At the age of sixteen she married Ulf Gudmarsson, afterwards seneschal of Norcia, by whom she had eight children. Her husband and she then made a vow of mutual continence. On her husband's death she founded the convent of Vadstena, in East Gothland, under the rules of St. Augustine. She was canonized in 1391. She had left, under the title *Revelations*, a series of mystic writings, which, after due examination by the proper

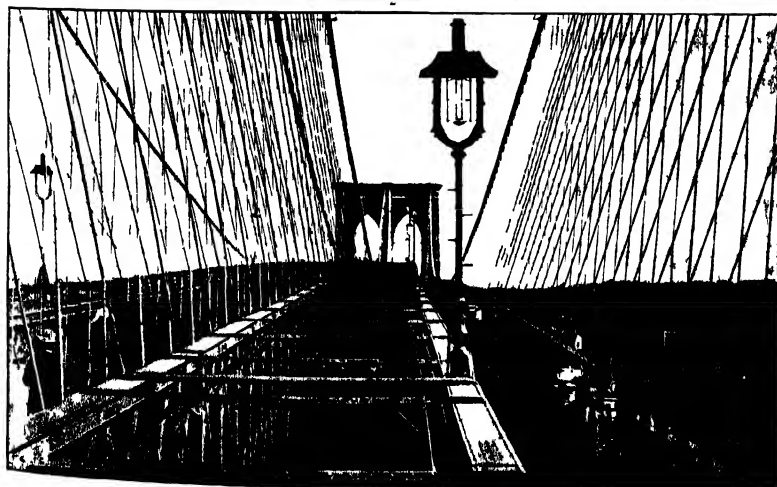
BRIDGL II



1



2



3

- 1 Tower Bridge, London (from a photograph by Valentine Dunlop) 2 Brooklyn Bridge, general view
3 View looking over Brooklyn Bridge showing the sections into which it is divided

authorities, were pronounced inspired by Gregory XI. and Urban VI. The Revelations have been translated into Latin and French. The order of St. Bridget, called also sometimes that of St. Salvator, or the Holy Saviour, continued in Sweden till the Reformation, and still includes some religious houses in Italy, Portugal, and other countries. Her youngest daughter, Catherine, was also canonized, and became the patron saint of Sweden.

BRIDGETON, a city, port of entry, and capital of Cumberland county, New Jersey, U.S., is situated on both sides of Cohansey Creek, 20 miles above its entrance into Delaware Bay, and is 40 miles s. of Philadelphia. It has an extensive iron-foundry and other manufactures, besides an active shipping trade. Pop. in 1890, 11,424.

BRIDGETOWN, the capital of the island of Barbados, in the West Indies. It extends along the shore of Carlisle Bay, on the s.w. coast of the island, and is nearly 2 miles long, and about half a mile broad. On entering the port, its appearance is very pleasing, the houses being embosomed in trees, while hills of moderate height rise behind, studded with elegant villas. Many of the houses have balconies, painted in gay colours, which give them a lively and cheerful appearance. The town contains a handsome square, called Trafalgar Square, in which there is a bronze statue of Lord Nelson, placed there with great ceremony in 1813. The principal buildings, none of which are in any way remarkable, are—the church of St. Michael, now the cathedral of the diocese, a large but plain edifice, rebuilt in 1789; the Church of St. Mary, the Jewish synagogue, the Central School, Harrison's Free School; a handsome market-place, shaded by trees; the barracks at the s. extremity of the city, and the military hospitals. Bridgetown has been at several periods much damaged by fire; the last calamity of that kind occurred in 1845, when a large portion of the town was destroyed. Pop. (1891), 21,000.

BRIDGEWATER, or **BRIDGWATER**, a municipal borough and port, in the county of Somerset, England, on the Parret. Although the town is about 10 miles from the sea vessels drawing 19 feet of water can come up to the quay at spring-tides; but great inconvenience is sometimes caused by the bore. The river divides the town into two parts, which are connected by an elegant iron bridge of one arch. The houses are generally well built, and chiefly of red brick. Among the chief buildings are the parish church (St. Mary Magdalene's), a handsome ancient structure, with a tower and spire; St. John's Church, the town-hall, a handsome building in the Venetian style; corn exchange, borough jail, market-house, and custom-house. There is a free grammar-school, an infirmary, and alms-houses. A considerable shipping trade is carried on, chiefly coastwise. The amount of tonnage entered and that cleared annually are usually about 180,000 tons. The imports are timber, grain, coal, tallow, wine, esparto, linseed, &c.; exports, timber, bricks, &c. The chief of its manufacturing industries is that of bath-bricks, which are made here (and indeed nowhere else) in great quantities. Ordinary bricks are also largely made, and there are engineering establishments, breweries, tanneries, foundries, oil-mills, &c. Bridgewater obtained its name, *Burgh-Walter*, from its having belonged to Walter de Douay, one of William the Conqueror's followers. In the civil war of the seventeenth century the inhabitants embraced the cause of Charles I., and defended the town resolutely against the Parliamentarians, but surrendered (1645) to Fairfax. In the castle built by King John the Duke of Monmouth lodged, and was here proclaimed king in 1685, before the battle of Sedgemoor,

which was fought about 3 miles from the town. Bridgewater then became the theatre of Feversham's and Jafferries' barbarity. Up till 1870, when it was disfranchised for bribery, Bridgewater returned two members to Parliament. Pop. in 1871, 12,059; in 1891, 12,429; in 1901, 15,208.

BRIDGEWATER, FRANCIS ECKERTON, DUKE OF, a British nobleman whose enlightened patronage of Brindley was the means of developing the genius of that celebrated engineer, and procured for himself the title of the Father of British Inland Navigation, was the youngest son of Scroop, fourth earl and first duke of Bridgewater, and born in 1736. He died unmarried on 8th March, 1803. In 1748 he succeeded his elder brother, the second duke. His estate of Worsley contained valuable coal-mines, and with the view of establishing a communication between these and the town of Manchester, at 7 miles' distance, he conceived the idea of effecting this object by a navigable canal. Having accidentally made the acquaintance of Brindley, and perceived his great engineering talents, he employed him in the construction of this work, which, after encountering much opposition and ridicule, was at last triumphantly carried through. (See **BRINDLEY**.) To the execution of this scheme the duke devoted all his energies and fortune, restricting his expenditure for many years to £400 per annum.

BRIDGEWATER CANAL. See **CANAL**.
BRIDGEWATER TREATISES. The Rev. Henry Francis, earl of Bridgewater, who died in 1829, bequeathed a sum of £8000, which, with the interest that might accrue on it, was to be placed at the disposal of the president of the Royal Society for the time being, and paid by him to the person or persons whom he should appoint to write and publish 1000 copies of a work, On the Power, Wisdom, and Goodness of God, as manifested in the Creation; illustrating such work by all reasonable arguments, as for instance, the variety and formation of God's creatures, in the animal, vegetable, and mineral kingdoms; the effect of digestion and thereby of conversion; the construction of the hand of man, and an infinite variety of other arguments; as also by discoveries, ancient and modern, in arts, sciences, and the whole extent of literature. The president of the Royal Society, then Davies Gilbert, consulted with the Archbishop of Canterbury and Bishop of London as to the best mode of giving effect to the intentions of the munificent testator, and acting on the suggestion which, in the above direction, he appears to have thrown out, resolved, instead of intrusting the execution of the work to one individual, to employ eight of the most distinguished in each of their several departments. Their names are Dr. Chalmers, Dr. Kidd, Dr. Whewell, Sir Charles Bell, Dr. Roget, Dr. Buckland, Rev. William Kirby, and Dr. Prout. The works thus written and published are known by the above name of the *Bridgewater Treatises*.

BRIDLE, the headstall, bit, and reins, by which a horse is governed. It is an instrument of high antiquity. Pliny ascribes the invention of the bridle to Pelethronius, king of the Lapithæ. The first horsemen guided their horses with a rope or stick, and the sound of their voice. A cord drawn through the nose is sometimes used for other animals. The ancient Thessalian coins often represent a horse with a long rein trailing on the ground. The Romans were trained to fight without bridles, as an exercise in the manege. On Trajan's Column soldiers are thus represented at full speed. The parts of a modern bridle are the snaffle or bit; the headstall, or leathers from the top of the head to the rings of the bit; the fillet, over the forehead, and under the fore-

top; the throat band, which buttons under the throat; the reins; the nose-band, buckled under the cheeks; the trench, the cavesson, the martingal, and the chaff-halter.

BRIDLINGTON, or BURLINGTON.—1. A town of Yorkshire, England, agreeably situated about a mile from the sea, 37 miles N.W. from York, on the Hull and Scarborough Railway, and consisting of one principal and several smaller streets. The parish church forms part of an ancient priory of elegant architecture, but now much defaced. There are Dissenting chapels and a grammar-school. A large trade is carried on in corn. Pop. (1891), 8919; (1901), 12,473.—2. **BRIDLINGTON QUAY**, a favourite bathing-place on the Yorkshire coast, about a mile S.W. of Bridlington. It consists of one principal and several smaller streets, and has a handsome district church, Wesleyan and Primitive Methodist chapels, and an excellent harbour, affording secure shelter to coasting vessels during adverse gales. Pop. 4521.

BRIDPORT, a seaport and municipal borough, in Dorsetshire, England, lying between the rivers Bride or Brit and Asker, in a fertile valley surrounded by hills, 15 miles west from Dorchester and about 1½ miles from the sea. The Bride and Asker unite a little below the town, the united stream being called the Brit, and form a safe and commodious harbour for vessels not over 250 tons. Bridport consists mainly of three spacious streets, containing many well-built modern houses, chiefly of brick. In the centre of the town is the town-hall and market-house, a handsome building in the Grecian style. The parish church of St. Mary's is a beautiful structure, cruciform, with a central tower, and contains a fine organ. At the northern entrance to the town is the more recent and less attractive St. Andrew's Church. There are besides several Dissenting chapels, schools, a library and scientific institute; and extensive manufactures of shoe-thread, twine, lines, sail-cloth, fishing-nets, &c. Bridport was a parliamentary borough from the reign of Edward I. to the passing of the Redistribution Act of 1885, when it was disfranchised. Pop. in 1891, 6611; in 1901, 5710.

BRIEF, an abridgment of a client's case, made out for the instruction of counsel on a trial. The brief in a case is drawn up by the attorney or solicitor employed by the plaintiff or defendant in the case, the attorney again employing the counsel. In the case of the party is to be concisely but fully stated; the proofs are to be placed in due order, and proper answers made to whatever may be objected against the cause of the client. In preparing the brief great care is requisite that no omission be made which may endanger the case.

BRIEF, PAPAL, is a sort of pastoral letter, in which the pope gives his decision on some matter which concerns the party to whom it is addressed. The brief is an official document, but of less public character than the bull. It usually deals with matters comparatively private and subordinate, not, as the bull, with matters affecting the church at large or an entire nation. It is not signed by the pope himself, but by an officer called *Il Segretario de' Brevi*, and is sealed on red wax with the pope's private seal, the fisherman's ring. Briefs are distinguished into two kinds—apostolical, those which issue from the pope himself; and penitentiary, issuing from the office which bears that name.

BRIEG, a town, Prussia, in the province of Silesia, on the left bank of the Oder, which is here crossed by a long wooden bridge, 26 miles S.E. from Breslau, population in 1895, 21,164. It has manufactures of linen, woollen, and cotton goods, ribbons, lace, leather, &c., and a trade greatly promoted by the completion of the Vienna and Breslau Railway.

BRIEL, or **BRILLE**, sometimes called the *Brül*, a town of the Netherlands, near the mouth of the Maas, province of South Holland, with a good harbour, well built, and strongly fortified. It is remarkable in history as the place where the Confederates laid the foundation of the Dutch Republic in 1572. Van Tromp was born here. The pop. is 4442, principally engaged in the fisheries.

BRIENNE, a small town of France, département of Aube (Upper Champagne), consists of Brienne-la-Ville and Brienne-le-Château, containing 2000 inhabitants. In the military academy formerly existing at Brienne-le-Château, Napoleon received his first instruction in the military art. Brienne-le-Château was afterwards celebrated as the scene of a portion of the final struggle in 1814, in which the empire was overthrown, Napoleon being here defeated by the Russians and Prussians under Blücher.

BRIENNE, CARDINAL DE LOMÉNIE DE. See **LOMÉNIE DE BRIENNE**.

BRIENNE, JOHN OF, a celebrated Crusader, born 1148; died 1237; was son of Erard II., count of Brienne; was present at the siege of Constantinople in 1204, and afterwards, in 1209, married the granddaughter and heiress of Amaury, king of Jerusalem. Brienne thus obtained an empty title, and having been crowned at Tyre in 1210, defended himself, though with a very inferior force, against the attacks of the Saracens. The Emperor Frederick II., having engaged to join the Crusade, provided the sovereignty of the Holy Land were ceded to him, Brienne abdicated in his favour, and gave him his eldest daughter Yolande in marriage. He afterwards in 1222 married Berengaria, sister of Ferdinand of Castile, as his second wife, and retired from the East; but the state of affairs there again brought him on the stage. He was crowned Emperor of the East in 1231, and continued to defend his dominions against all aggressors, more especially against the united forces of Vatatzes, emperor of Nicea, and Azzan, king of Bithynia.

BRIENZ, a town, Switzerland, canton Bern, beautifully situated on a narrow ledge at the foot of the Bernese Alps, and on the N.E. shore of the Lake of Brienz, the shore of which, in the vicinity of the town, is lined with gardens. The church, built in 1215, together with some old ruins and a handsome school, is finely situated on a height. Brienz is a frequent resort of tourists *en route* through the Pass of Brünig to Lucerne. In the neighbourhood is the Lake of Brienz (Brienzer See), one of the most picturesque in Switzerland, which is formed by the river Aar, and throws itself through the Valley of Interlaken, into the Lake of Thun (Thuner See), which is on a level of 24 feet below it. The trade is in excellent cheese. Pop. (1900), 2580.

BRIEUC SR. (Briocum), a town, France, in the département of Côtes du Nord, about a mile above the mouth of the Gouet, in the Bay of St. Briec. It is very poorly built, but contains an ancient cathedral, a diocesan seminary, a school of hydrography, and a library of 20,000 volumes. Its port, in the village of Légué, at the mouth of the river, admits vessels of 300 to 400 tons, and is engaged to some extent in the Newfoundland cod fishery. On a height near it are the remains of the Tower of Cesson, which is visible 15 miles at sea. Pop. (1891), 16,741.

BRIG, or BRIGANTINE, a square-rigged vessel with two masts. The term is applied to different kinds of vessels by mariners of different countries. The term *brigantine* was formerly applied to a light, flat, open vessel, with ten or fifteen oars on a side, furnished also with sails, and able to carry upwards of 100 men. The rowers being also soldiers, had their muskets lying ready under the benches. Brigantines were frequently made use of, especially in the Medi-

terrenean, for the purpose of piracy, from which they derived their name, being very fast sailers.

BRIGADE, in general an indeterminate number of regiments or squadrons. In the British army a brigade of infantry is generally composed of three regiments; a brigade of horse, of from eight to twelve squadrons; and one of artillery, of five guns and a howitzer. A number of brigades form a division, and several divisions an army corps. A brigade-major is the chief of the brigade-staff. A brigadier-general is the officer who commands a brigade. In the British service his pay is forty shillings a day. In the United States army two regiments of infantry or cavalry constitute a brigade, which is commanded by a brigadier-general. The brigade was introduced by Gustavus Adolphus, whose example was followed by Turenne, who formed brigades of 3000 to 4000 men. The use of the term in the French service is somewhat equivocal. In the gendarmerie, as formerly in the cavalry, a brigade is the small fraction of an army under the command of a subaltern officer. In the regular army a brigade now contains two or three regiments of infantry or cavalry, or else a mixed body.

BRIGANTINE. See *BARG*.

BRIGGS, HENRY, a celebrated mathematician, born in 1556 at Warley Wood, near Halifax, Yorkshire, entered St. John's College, Cambridge, and distinguished himself by his acquirements in mathematics. In 1598 he was appointed first lecturer on geometry in the newly-elected establishment of Gresham House or College, London, and in 1619 became in like manner first Savilian professor of geometry at Oxford. This professorship he held till his death in 1630. Briggs' great works are his *Logarithmorum (hinc Præ)* (1617), *Arithmetica Logarithmica* (1624), and *Trigonometria Britannica* (1633).

BRIGHT, JOHN, a politician and one of England's greatest orators, was born at Greenbank, Rochdale, Lancashire, 16th Nov. 1811, and died 27th March, 1889. His father, Jacob Bright, who belonged to a Quaker family originally connected with Wiltshire, migrated to Rochdale early in the century, and there established himself as a successful cotton-spinner and manufacturer. The son, John Bright, who was the second of ten children, was educated at Rochdale, Ackworth, York, and finally at Newton, near Clitheroe. At the age of fifteen he entered the cotton-spinning business of his father, where, even at that early age, he showed much shrewdness and practical energy. Not satisfied, however, with merely mercantile affairs, he took an enthusiastic interest in such public questions as the abolition of slavery and the Reform Bill of 1831-32, while he diligently educated himself in public speaking at the debates of the Rochdale Literary and Philosophical Society. In 1835 he travelled in Greece, Egypt, and Palestine, and gave an account of the journey in a series of lectures delivered in his native town; but his career as a notable public speaker began with the free-trade movement. To relieve the pressure upon the working population of England occasioned by commercial depression and a bad harvest, it was proposed to cheapen bread by the repeal of the corn duty, and in an association formed for this purpose at Manchester in 1838 Mr. Bright was made a member of committee. In the following year this association, at a meeting in London, was widened into the famous Anti-Corn Law League, with Richard Cobden and John Bright as its two most prominent members. Yet it was not until after the death of his first wife in 1841 that the latter put all his strength into the repeal campaign. In the autumn and winter of that year he organized branches of the league and addressed meetings in nearly all the large towns of

England. It was inevitable that such a prominent politician should find a place in Parliament, and accordingly, in 1843, he was elected as representative of the city of Durham. Having entered Parliament, he made his maiden speech in August of the same year on a motion in favour of carrying out the recommendations of the Import Duties Commission of 1840. Thereafter he seized every opportunity to press this question of repeal. The opposition from both of the great parties in the house was dogged, and the controversy might have lasted long but for the wide-spread sympathy occasioned by the Irish famine. In January 1846 Parliament was summoned, and Sir Robert Peel announced that his government was prepared to reduce and almost abolish the corn duties. This resolution was carried, but on the question of Irish coercion the government was defeated, and at the general election which followed (1847), John Bright was elected for Manchester. The corn duty question having been satisfactorily settled, he now turned his attention to such subjects as a reform in the affairs of Ireland and India, an extension of the suffrage, the adoption of voting by ballot, and the establishment of a national system of education. At the dissolution of Parliament in 1852 he was re-elected for Manchester, but by his strenuous denunciation of the Crimean war (1854), and his equally decided disapproval of the Chinese war (1856), he was rejected by his constituency at the general election of 1857. This result was made known to him at Florence, where he had retired to recruit after a serious illness, but the disappointment which it caused him was mitigated in a few months by his election for Birmingham, and in 1858 he returned to public life after an absence of two years. During the American civil war he sturdily advocated the abolition of slavery, and gave his passionate adherence to the cause of the North, although as a Lancashire cotton-spinner his business suffered severely from a continuance of the struggle. About this time, also, his name became closely identified with reform in the electoral representation, and he had the satisfaction of seeing the principles for which he had contended embodied in the Reform Bill (1867) passed by Mr. Disraeli. He had no desire for office, but his presence in the cabinet councils of the Liberal party had now become so necessary, that he was constrained to accept the presidency of the Board of Trade in Mr. Gladstone's government (1868), and in this position he gave powerful assistance in passing the act for the disestablishment of the Irish Church, the Irish Land Act, and the Elementary Education Act. Owing to ill health he retired from office in 1870, but re-entered the ministry as chancellor of the Duchy of Lancaster in 1873. When the Liberal party returned to power in 1880 he again accepted this position, but two years later he found it necessary to resign because he disagreed with his colleagues on their Egyptian policy and the bombardment of Alexandria. At this time and for some years previously he had not appeared often upon public platforms, but in 1883 he delivered a notable speech when installed as lord-rector of Glasgow University, and another in Birmingham in the same year when celebrating the 25th anniversary of his connection with that city. In 1886 he opposed the Home Rule Bill introduced by Mr. Gladstone, and until his death he strongly identified himself with the Unionist party in their efforts to defeat the Home Rule policy. This opposition was weighted with the same characteristics which had secured his success in previous movements—a transparent sincerity of purpose which found its fearless exposition by pen and speech in direct, racy, idiomatic English. As an orator his platform manner was remarkable

for its ease and unstudied simplicity; the richness and lucidity of his diction abounded in happy epithets, often edged with irony or glancing with humour; a spirit of outspoken truthfulness breathed through all his utterances; while he was possessed of a voice which laid a spell upon his audience by its clear, round, sonorous fullness. Perhaps the most splendid expression of his sympathetic nature is found in the speeches in which he pleaded for justice to the oppressed populations whether in Ireland or India, while the same broad humanity, even more than the doctrines which were his Quaker birthright, animated his denunciations of war. He was a member of the Society of Friends, and was married first to a Miss Priestman, who died in 1841, and again to a Miss Leatham, who died suddenly in 1878. His life and speeches in 2 vols. were published in 1881 by G. Barnett Smith, and his public letters by H. J. Leech in 1885.

BRIGHT'S DISEASE (so-called from Dr. Bright of London, who first described the disorder), a name given to various forms of kidney disease, especially to that which is characterized by a granular condition of the cortical part of the kidneys and inflammation of the malpighian bodies. The urine during life contains albumen, and is of less specific gravity than natural. The disease is accompanied with uneasiness or pain in the loins, pale or cachectic countenance, disordered digestion, frequent urination, and dropsy. The blood contains urea, and is deficient in albumen and corpuscles. Progressive blood poisoning induces other visceral diseases, and in the end gives rise to the cerebral disturbance which is the frequent cause of death.

BRIGHTON (formerly *Brighthelmston*), a maritime town and favourite watering-place in England, county of Sussex, 50½ miles from London. It is situated on a gentle slope, and is protected from the north winds by the high ground of the South-Downs, immediately behind the town. Brighton is a clean and well-built town, with handsome streets, terraces, squares, &c., and a massive sea-wall, with a promenade and drive over 3 miles in length, one of the finest in Europe. The buildings of note are entirely modern, and not numerous. The most remarkable is the Pavilion, built by George IV. (then Prince of Wales) between 1787 and 1825. It cost upwards of a million pounds. It is a building in the oriental style of architecture, with a handsome stone front 300 feet in length, and a large oriental dome 84 feet high in the centre. The Pavilion was discontinued as a royal residence by Queen Victoria, and was purchased of the crown by the town of Brighton in 1850. Twelve rooms are appropriated for a public library, museum, and art gallery, which were opened in 1873. The stables are now an assembly-room ('The Dome'), capable of holding 3000 persons. The riding-school now forms a corn-exchange. The structure, its out-buildings and gardens, which are open to the public as pleasure-grounds, cover about 9 acres. A very large and complete aquarium was opened at Brighton in 1872, at a cost of about £100,000, and constitutes a great attraction. Other buildings worthy of notice are the town-hall, a large massive building, which has recently been modernized at great cost; the market-house, the county hospital, the eye infirmary, blind and orphan asylums, sanatorium, &c. There is a fine iron pier, the West Pier, with a length of 1209 feet and a breadth of from 140 to 55; and a new pier erected in place of the old chain pier. Among the numerous places of worship there are some very handsome structures. The educational institutions comprise the Brighton College, for the education of the sons of wealthy people; an institution for the education of

the daughters of poor clergy; a diocesan training-school for school-mistresses; National, British, and other schools, including a vast number of boarding-schools. Brighton has no manufactures, but the mackerel and the herring fisheries are extensively carried on, and produce about £25,000 annually.

Brighton was for some centuries a populous fishing-village, but its fisheries were greatly injured in the foreign wars of the seventeenth century. About the middle of last century its advantages as a bathing and health resort were made known by Dr. Russell. This resulted in the town attracting the support of the Prince of Wales (afterwards George IV.), and since then it has enjoyed a career of almost unparalleled prosperity. The only historic event of interest connected with Brighton was the escape of Charles II. from the town in 1651 in a fishing-boat. Brighton has since the Reform Bill of 1832 sent two members to Parliament, and was incorporated in 1854. The pop. in 1801 was only 7389; in 1881 it was 77,693; in 1871, 90,013; in 1881, 107,546; in 1891, 115,873; in 1901, 123,478. Pop. of parliamentary borough in 1871, 108,760; in 1881, 128,440; in 1891, 142,129; in 1901, 153,393.

BRIGNOLES (*Brinonia*), a town in France, department of Var, 22 miles w.s.w. of Draguignan. It possesses a normal school for the department, is the seat of courts of first resort, and has manufactures of common cloth, silk, crockery, soap, wax candles, glue, with distilleries, tanneries, and silk and felling mills. The neighbourhood produces olive-oil, and large quantities of excellent prunes, called *prunes de Brignoles*. Brignoles was taken and sacked in 1595 by Charles V. Pop. (1896), 3929.

BRILL, the name of two brothers who distinguished themselves as landscape painters.—1. MATTHEW, born at Antwerp in 1550; died in 1584; repaired when a very young man to Rome, and was so much esteemed by Gregory XIII. that he was employed on the galleries and saloons of the Vatican.—2. His brother PAUL, born about 1556, died about 1628, was much superior to him, and hearing of his success at Rome joined him there. The two brothers appear for some time to have worked together on the same pieces; but after Matthew's early death Paul was employed by Sixtus V., and executed six large paintings in his summer palace. He also executed a large fresco 68 feet long, and proportionably high, in the Sala Clementina of the Vatican for Clement VIII. Its subject is the Martyrdom of St. Clement. His chief merit is the improvement he effected in landscape-painting, which he is said to have been the first to raise to the dignity of an independent branch of art. In the latter part of his life he painted some exquisitely finished miniature landscapes on copper.

BRILL, or **PRALL** (*Rhombus vulgaris*), a fish resembling the turbot, but inferior to it both in size and quality, and distinguished from it by its inferior breadth and by the perfect smoothness of its skin, being devoid of bony tubercles. The brill is of a pale-brown colour above, marked by scattered yellowish or reddish spots, and covered with moderately-sized scales. It is found on many parts of the British coast, and is particularly abundant in the English Channel, from which large quantities are sent to the London market. Though inferior in flavour to the turbot, its flesh is of good quality.

BRILLIANT. See **DIAMOND**.

BRIMSTONE, a name for sulphur, especially for sulphur purified by melting and allowing the impurities to subside, the melted mass being then poured, in the liquid state, into cylindrical moulds, in which it becomes hard. See **SULPHUR**.

BRINDISI (ancient *Brundisium*), a seaport and fortified town in the province of Lecce, Southern

Italy, 45 miles S.W. of Taranto. In ancient times Brundisium was one of the most important cities of Calabria. It was one of the chief cities of the Salernitines, and the excellence of its port and commanding situation in the Adriatic were among the chief inducements to the Romans to attack them. The Romans made it a naval station, and it was the scene of important operations in the war between Cæsar and Pompey. On the fall of the Western Empire it declined in importance. In the eleventh century it fell into the possession of the Normans, and became one of the chief ports of embarkation for the Crusades. Its importance as a seaport was subsequently completely lost, and its harbour blocked. In 1870 the Peninsular and Oriental Steam Navigation Company put on a weekly line of steamers between Brindisi and Alexandria, and Brindisi has since been an important station for passengers and mails to and from India and the East. There is also a trade with British, Austrian, and other ports. Latterly the harbour accommodation has been considerably improved. The chief exports are wine, olive-oil, and figs; the chief import, coal. Pop. (est.), 18,000.

BRINDLEY, JAMES, an eminent engineer, was born at Thornsett, Derbyshire, in 1716; died at Turnhurst, Staffordshire, on Sept. 30th, 1772. At seventeen he became apprentice to a millwright, and on the expiration of his indentures he commenced business as an engineer, and in 1752 displayed great talent in contriving a water-engine for draining a coal-mine. Several important inventions introduced him to the patronage of the Duke of Bridgewater, then occupied in planning a communication between his estate at Worsley and the towns of Manchester and Liverpool by water. This immense work, which was ridiculed by scientific men of the period as impracticable, Brindley undertook and carried out by means of aqueducts over valleys, rivers, &c. The first portion of the Bridgewater Canal (to Manchester) was opened in 1761, the whole system being complete in the end of 1772. His success had caused Brindley to be employed, in 1766, to unite the Trent and Mersey, upon which he commenced the Grand Trunk Canal, but, dying before its completion, the work was finished, in 1777, by his brother-in-law, Mr. Henshaw. Latterly, scarcely any work of the kind in the kingdom was entered upon without his superintendence or advice, and in all he constructed or planned about 365 miles of canal. Among other designs, he prepared one for draining the fens of Lincolnshire and the Isle of Ely, and another for clearing the Liverpool docks of mud, which was especially successful. So partial was he to artificial inland navigation, that to a question humorously put to him in an examination before the House of Commons, 'For what purpose did he consider rivers to have been created?' he is said to have replied at once, 'To feed navigable canals'. See SMILES'S *Lives of the Engineers*.

BRINE is water saturated with chloride of sodium or common salt, like the water of the ocean. It is naturally produced in many parts of the world beneath the surface of the earth, and flows out in springs, or is pumped out for the use of salt manufacturing. Brine is also used artificially, for preserving meat. See SALT.

BRINE-SHRIMP, a popular name for a genus (*Artemia*) of crustaceans of the family Branchiopoda. *A. salina* is a species about half an inch in length, found in brine pools in various countries, being exceedingly abundant in the Great Salt Lake of Utah. In 1871 and succeeding years the Russian naturalist Schrankewitch succeeded, by gradually increasing the salinity of water containing individuals of *A. salina*, in transforming them into a distinct species

(*A. müllhausensis*) of the same genus; and by gradually rendering the medium less salt he actually changed them into individuals of a different genus (*Branchinecta*).

BRINVILLIERS, MARIE MADEMOISELLE MARQUERITE D'AUBRAY, MARCHIONNESS OF, born in Paris about 1630, executed July 16th, 1676. She was the daughter of a civil-lieutenant of Paris, and married in 1651 the Marquis of Brinvilliers. The marriage at first seemed happy, and in the course of ten or eleven years they appear to have had three children. About 1659 the marquis introduced to his house a young cavalry officer, named Godin de Sainte-Croix, for whom his wife conceived a violent passion. The marquis, occupied with his own pleasures, seemed indifferent, but her brothers remonstrated, and her father, scandalized at her misconduct, had Sainte-Croix openly arrested in her carriage and taken to the Bastille in 1665. Sainte-Croix remained in prison about a year, and made there the acquaintance of an Italian, who taught him the art of preparing poisons. On his liberation he imparted his discoveries to Madame de Brinvilliers, who was eager to turn them to account. She had in the meantime assumed an air of piety, visiting the hospitals, and ministering to the sick, and had thus reconciled herself to her family; but the affront offered her by her father remained in her mind, and she had resolved to revenge it. Sainte-Croix, apparently from cupidity, seconded her design. He supplied her with poisons, with which she experimented first on the patients in the hospital. She occupied eight months in administering poison to her father, and at last killed him suddenly without being suspected. By the aid of Lachaussee, an old domestic of Sainte-Croix, whom she caused to enter their service, she also succeeded in poisoning her brothers. She is said to have attempted her husband, with a view to marry Sainte-Croix, but did not succeed. Sainte-Croix died suddenly, it is said from the falling off of a mask of glass which he used to protect himself in preparing a subtle poison. A packet addressed to Madame Brinvilliers, containing poisons labelled with descriptions of their effects, revealed their conspiracy. Among a number of passionate letters there was also one containing a promise of 30,000 francs, which Sainte-Croix had exacted as the price of his assistance. Madame Brinvilliers fled to Liège, and took refuge in a convent. Her extradition being obtained, she was inveigled from the convent by a pretended lover, brought to Paris, and on the evidence of Lachaussee, together with her own confession, condemned to be beheaded and afterwards burned.

BRIOUDE, a town of France, department of Haute Loire, near the left bank of the Allier. The only edifices of note are the college, and the old church, a specimen of the Byzantine style. Pop. (1896), 4661.

BRISACH, or BRISACH, OLD, a town of Germany, in Baden, on the Rhine. Formerly a very strong place, it was taken in 1638 by the Duke of Saxe-Weimar, and was bombarded by the French in 1793. New Brisach, on the w. side of the river, in Alsace-Lorraine, was founded by Louis XIV. in 1690 to compensate for the loss of Old Brisach, and was fortified by Vauban. It was surrendered to the Germans in 1870 after a siege of a month, and the fortifications were demolished. Pop. (1895), 3307.

BRISBANE, a city of Australia, capital of the colony of Queensland, on the Brisbane river, about 25 miles by water from its mouth in Moreton Bay, and about 500 miles north of Sydney. The river flows through the town in a winding course, its general direction being S.W.-N.E. Of the four parts

into which the town is divided, North Brisbane is situated in the heart of the city, on the north bank, and South Brisbane, now a separate municipality, faces it on the south. Fortitude Valley is a large division on the north bank, to the east and north-east of North Brisbane, mostly situated on a peninsula formed by the winding of the river. The fourth division, Kangaroo Point, is a small one, on the south bank, comprising a point of land projecting between North Brisbane and the above peninsula. The streets are laid out as regularly as the tortuous course of the river will permit. The chief buildings are situated in North Brisbane, among them being Parliament House, where the legislature sits; Government House, in the Botanic Gardens; the government offices; the supreme court; the post-office; the technical college; the Treasury Buildings, a large structure of great architectural beauty; the old and the new town-hall; and the customs'-house. Many of the banks have fine edifices, particularly the Queensland National Bank. The chief educational institutions are the Normal School, the boys' and girls' grammar-schools, and the school of the Christian Brothers. The Roman Catholics have a fine cathedral (St. Stephen's), opposite the post-office, and there are fine churches belonging to the Church of England, the Presbyterians, the Baptists, the Wesleyan and Primitive Methodists, and other denominations. Other buildings and institutions worthy of mention are the masonic and temperance halls; the school of arts, with a good library; the museum, to be converted into a free library; the Queensland Club; the large general hospital, and several special hospitals; an orphanage and a large jail in South Brisbane; the Opera House, one of the best theatres in Australia; a brick building in Fortitude Valley, with a fine concert-hall and organ, replacing exhibition buildings which were destroyed by fire in 1888, and to be used as a museum; &c. The Victoria Bridge connects South with North Brisbane. It cost upwards of £110,000, and replaces an older one which was destroyed by a flood in 1893. It consists of six steel spans supported on five cast-iron cylinders filled with concrete, the abutments being of masonry and concrete; and the total length is about 1041 feet. Much of the cross-river traffic is carried on by the ferries. South Brisbane contains, in addition to buildings already mentioned, a court-house, town-hall, extensive markets, schools of art, technical college, deaf and dumb and blind institutions, &c.; and in Fortitude Valley there are several good halls, a convent school, a racecourse, &c. The leading parks and gardens are the Botanic Gardens, with the Queen's Park, in North Brisbane, at the river-side, finely laid out; Victoria Park, to the north of North Brisbane; Albert Park, Mount Coot-tha, Bowen Park, and the gardens of the Acclimatization Society in Fortitude Valley; and Musgrave, Dutton, and Woollongabba parks in South Brisbane. There is extensive wharf accommodation, and South Brisbane has a dry dock. There is regular steamer connection with Sydney, London, and elsewhere, and adequate railway communication with Sydney and other chief towns in Australia. There are electric street tramways, and the city is lighted by gas and well supplied with water. The climate is dry and healthy, but the temperature is often very high during the summer. Among the industrial establishments are a sugar-refinery, tobacco factories, flour-mills, &c. The trade is important, among the exports being gold, wool, sugar, &c. Originally founded as a penal settlement in 1825, Brisbane was incorporated in 1859. Pop. (1891), 93,657; (1901), 119,428.

BRISBANE, GENERAL SIR THOMAS MACDOUGALL,

an eminent soldier and astronomer, was born at Brisbane, near Largs, the seat of his family, 23rd July, 1778; died 27th January, 1860. At the age of sixteen he entered the army as an ensign, and in 1798 he raised a company in Glasgow, and took part in all the engagements of the campaign in Flanders. In 1796 he was sent to the West Indies, where he distinguished himself by his services under Sir Ralph Abercromby. In 1812 he commanded a brigade under the Duke of Wellington in Spain. He took part in the battles of Vittoria, Orthes, and Toulouse, and received the thanks of Parliament for conspicuous bravery at the battle of the Nive. On the abdication of Napoleon he was sent to America, and did not return in time to take part in the battle of Waterloo. In 1821 he was appointed governor of New South Wales, which post he continued to occupy for four years. His administration was active and intelligent, and tended greatly to promote the prosperity of the colony. He introduced at his own expense a good breed of horses, and promoted the cultivation of the vine, as well as of sugar, cotton, and tobacco. At the same time he devoted himself with great diligence to the study of astronomy. He had an observatory erected at his residence of Paramatta, and catalogued 7885 stars, until then scarcely known to astronomers. For this great work, known as the Brisbane Catalogue of Stars, he received the Copley medal of the Royal Society, which he valued above all his military honours. On his return to Scotland he devoted himself entirely to science. He had an astronomical, and later a magnetic observatory established at his residence at Makerston. The observations which he made there, with the aid of able assistants, fill three large volumes of the published Transactions of the Royal Society of Edinburgh, of which he was president from the death of Sir Walter Scott. He founded two gold medals for scientific merit, one in the gift of the Royal Society, the other in that of the Society of Arts.

BRISSEN. See **ACHILLES.**

BRISGAU, also **BRISGAT**, a district of the grand-duchy of Baden, between the Rhine and the Black Forest, which, with the district of Ortenau, formerly constituted a landgraviate in the south-western part of Suabia. This is one of the most fertile parts of Germany. Though chiefly in possession of Austria since the fifteenth century, it was governed by its own laws. At the Peace of Lunéville (1801) Austria ceded Brisgau, one of the oldest possessions of the House of Hapsburg, to the Duke of Modena, after whose death it fell to his son-in-law, the Archduke Ferdinand of Austria, as Duke of Brisgau. By the Peace of Presburg (1805) it was assigned to Baden, with the exception of a small part, and still belongs to the grand-duchy.

BRISAC. See **COSSÉ.**

BRISSET DE WARVILLE, JEAN PIERRE, a French political writer, and one of the leaders of the party of the Girondists, was born in 1754, executed 30th October, 1793. He took the name D'Ouarville, which he afterwards anglicized into De Warville, from the village of Ouarville, near Chartres, where he was born or educated. He was the son of a wealthy restaurateur, who gave him a good education, and he was his father's thirteenth child. He was designed for the law, and placed with a procurator in Paris; but he early turned his attention to public affairs, associating himself with such men as Pétion, Robespierre, Marat, &c. In 1780 he published his *Théories des Lois Criminelles*, and two years afterwards an important collection called the *Bibliothèque des Lois Criminelles*. During this period he also engaged in periodical literature, editing for a time, at Boulogne-sur-Mer, the *Courier de l'Europe*, a translation from

an English journal. He also visited England, where he endeavoured to found a lyceum and establish a journal in connection with it. Failing in this enterprise, he returned to Paris, where his works had already classed him among the philanthropic theorists of the day. He was suspected of the authorship of an anonymous pamphlet, and thrown into the Bastille. On his liberation he engaged with Clavières and Mirabeau in some works on finance, which appeared under the name of the latter. Threatened with a new arrest, he escaped to England, and being there introduced to the Society for the Abolition of Negro Slavery, he resolved to form a similar society in Paris. This society, which numbered many distinguished names among its members, and ultimately accomplished its object, he founded along with Clavières, Mirabeau, and others, and undertook a voyage to the United States to study on its behalf the problem of emancipation. On his return the revolution was about to break out, and Brissot embraced it with ardour. He was not a member of the States-general, but was elected to the National Assembly for Paris and to the Convention for the department of the Eure et Loir. As leader of the Girondist party, his history belongs henceforward to the history of France. He voted, out of policy, for the death of Louis XVI, subject to confirmation by the vote of the people; and he caused war to be declared against Holland and England in February, 1793. This was his last political act. Until the close of his career he was engaged in defending himself against the Montagnards. Brissot was inferior to Vergniaud as an orator, but his writings exercised a powerful influence on the revolution. In the early part of his career his opinions were very extreme. In a passage which was afterwards used against him he carried his advocacy of individual rights so far as to justify not only theft, but cannibalism. Proudhon was accused of having borrowed from him the maxim, 'La propriété c'est le vol'.

BRISTOL, a city of England, and at the same time a municipal, parl., and county borough, is situated partly in Gloucestershire, partly in Somersetshire, but forms a county in itself. It stands at the confluence of the rivers Avon and Frome (or Froom), which unite within the city, whence the combined stream (the Avon) pursues a course of nearly 7 miles to the Bristol Channel. The Avon is a navigable river, and the tides rise in it to a great height. Bristol is due west from London, and distant 118 miles. It stands partly on a number of eminences, partly on the lower ground at their foot. The manufacturing and business parts are upon the lower levels, whilst the hills are now almost wholly covered with private houses. The districts of Clifton, Redland, and Cotham, situated within the limits of the borough and in the midst of charming scenery, are studded with mansions and villas, the attractions of these portions of the city being greatly increased by the Clifton and Durdham Downs. The bed of the river Avon is situated about 315 feet below the summit of Clifton Down, from which a handsome suspension-bridge is thrown across the river, uniting the two counties. Its length from the centres of the piers is 703 feet, its height above high-water mark 245 feet. The public buildings of Bristol are numerous and handsome. The number of places of worship is very great, there being few sects with any following at all in the United Kingdom that are not represented. The first place is due to the cathedral, which was founded in 1142, and was originally an abbey church. It exhibits various styles of architecture, the chapter-house and its vestibule being Norman, the Lady Chapel early English; the chancel and choir, the Berkeley and Newton chapels

decorated; the groining of the transepts, the central tower, and cloisters perpendicular. The nave, its aisles, and western towers are modern additions, having been erected at intervals since 1865. There are several fine old churches, but they are all excelled by St. Mary Redcliff, which is perhaps the finest parish church in the kingdom. It is commonly said to have been founded by Simon de Burton, about 1293, but part of it is considerably older than this, and is believed to be as old as 1200. It is built in the form of a cross, with a nave and aisles like a cathedral, and with a tower and spire. The western door is the principal entrance, but there are also porches on the northern and southern sides. The south porch, the south transept, the tower, and much of the lower part of the church belong to the decorated style, and the north porch is an exquisite specimen of it, the interior in particular being very beautiful. The remainder of the church, including the clerestory, is of the perpendicular period. William Canynge or Canning, mayor of Bristol, whose name is so prominent in the Chatterton controversy, is said to have restored this church about 1445-47. Speaking of this church Brillon says—'The rich decorated tower, west front of the church, unique north porch and transept, with flying buttresses, pinnacles, and perforated parapets, all unite to constitute a mass of architecture which cannot fail to delight the artist and astonish the common passenger—and in the fascinating combination of clustered pillars, mullioned windows, panelled walls, and groined ribbed ceilings of the interior I know of no building to compare with it in all these features in Great Britain'. It has latterly undergone extensive restoration at a cost of nearly £50,000. Other churches worthy of notice are Temple Church, with its leaning tower, St. Stephen's, St. Mary-le-port, St. Philip's, St. James's, and St. John's. Under the tower of this last church was one of the entrances to the ancient city of Bristol, and the gateway still exists, being the approach from Broad Street to Nelson Street. The Independents, Baptists, and Wesleyans have some noteworthy chapels, such as Clifton Down Chapel, Victoria Chapel, Highbury Chapel, Broadmead Chapel, in which the Rev. Robert Hall officiated, &c. The Roman Catholics have a pro-cathedral in Clifton, and several chapels and convents. There is also a Jewish synagogue. For public meetings there are two large halls, one in Clifton, called the Victoria Rooms, the other, more immediately in the centre of the city, called Colston Hall, destroyed by fire in 1898 and now being rebuilt. Bristol is rich in modern as well as in ancient architecture; we may mention in particular the exchange, the guild-hall, the museum and reference library, the new grammar-school, the fine arts academy, the West of England and other banks, insurance offices, &c. The most modern public building is the Cabot Tower, on Brandon Hill, inaugurated in 1898. The charities of Bristol are exceedingly numerous, the Ashley Down Orphanage, for the orphans of Protestant parents, being the most remarkable. It is situated without the limits of the borough upon an eminence to the N.W. of the city. This institution was started in 1836 by the Rev. George Müller, and managed by him till his death in 1898 (aged 93). Mr. Wright, Mr. Müller's son-in-law, is now at the head of it. From small beginnings it has grown until it may now be described as a village of orphans. Besides the orphanage there are many schools supported by the friends of the institution; but the funds belonging to these are kept separate from those of the orphanage. The total of the moneys received for the various institutions has amounted to £1,500,000.

and the whole of this was obtained without anyone having been personally applied to for anything. Bristol has a number of endowed schools, the principal of which are the grammar-school, Queen Elizabeth's hospital or city school for boys, the Red Maids' school for 80 girls, Colston's boarding-school, and the cathedral school. All these have recently been put under improved management by the charity commissioners. The principal institution for the higher education is the University College, opened in 1876, and having a medical school attached to it. The Baptists have a college in which young men are trained for the ministry. Clifton College, which supplies a high-class education to some 600 boys, was opened in 1862. The Merchant Venturers' Technical College is an institution of recent origin. There are also three schools of art, and blind and deaf and dumb asylums. At Clifton there are zoological gardens. The Public Libraries Act was adopted in 1874, and the chief library is based upon an ancient city library which received a site as early as 1618. There are in addition six district libraries. There is also a large reference library attached to the Bristol museum. Tramway cars for passengers from Bristol to various suburbs began to run in 1875. Electric traction (overhead wire system) exists already, and is to be applied to the whole system.

Bristol has long been famous for its glass-works, potteries, soap-works, tanneries, tobacco factories, chocolate factories, and chemical works, as well as for its ship-building and machinery yards. Coal is found and worked extensively within the limits of the borough. Bristol carries on an export and import trade with all parts of the world. The United States, Canada, South America, the West Indies, Australia, France, Belgium, Spain, Italy, Germany, Russia, Norway, Sweden, and Denmark all have a good share of the trade. Cereals and flour are the most important imports (together amounting to £4,700,000 in 1898), others being cheese, butter, bacon, cattle, sugar, timber, petroleum, hides. The total value of imports in 1898 was fully £11,000,000. The value of the exports was only about £1,400,000, the chief being copper and metal goods. The customs dues received in 1898 amounted to £1,617,220. The dock and city dues collected on shipping and goods in 1898 amounted to £113,516. The net register tonnage of vessels that entered from foreign countries and British possessions in 1898 was 737,543 tons; the net register tonnage entered coastwise was 778,283 tons. The port of Bristol extends from Hanham Mills, on the Avon, to its mouth at King-road, thence down the Bristol Channel westwards to the Steep Holms, and in a straight north-east direction therefrom to Aust Cliffs, on the banks of the Severn, twelve miles above Kingroad. The present dock system within the port comprises a dock of 19 acres at Avonmouth on the Gloucestershire bank of the Avon, one of 12 acres (deep water area) at Portishead on the Somersetshire bank of the river, two miles below Avonmouth, and a floating harbour of 70 acres in the heart of the city. In March, 1902, the first sod was cut of a new dock at Avonmouth, estimated to cost £2,000,000. The railway accommodation is unsatisfactory. The Great Western, the Midland, the Somerset and Dorset, and the North-Western lines have arrangements in the city for the despatch of goods and passengers. The railway from the Avonmouth or Channel Dock reaches the terminus at the city by means of a tunnel 1737 yards long, under Durham Down. Various schemes for additional shipping accommodation involving a heavy outlay have recently been put forward.

The sanitary condition of Bristol is on the whole good, and it is one of the healthiest of the large

towns of the kingdom. At present the sewage of the city, as well as much of that of the district, is simply discharged into the river a short distance from the town, an arrangement that can only be regarded as temporary. The town's water is chiefly obtained from Chewton Mendip, East Harptree, Barrow, and Chelvey. The electric lighting of the city is said to be one of the best in the United Kingdom.

The Celtic name of Bristol was *Caer Oder*, or the City of the Chasm (viz. through which the Avon flows). The name Bristol is derived from the Anglo-Saxon *brig*, a bridge, and *stow*, a place. It was early a place of commerce. Between 1239 and 1247 a new channel was dug for the Frome, in order to provide better accommodation for shipping. In the reign of Edward I. Bristol rebelled against the royal authority, and was held by the citizens against the sovereign for four years. In 1373 it was constituted a county of itself by Edward III. It was made the seat of a bishopric by Henry VIII. in 1542. During the civil war between Charles I. and the Parliament it declared in favour of the latter, but was stormed and taken by the Royalists under Prince Rupert. After the battle of Naseby it was taken by Fairfax, and its formidable castle was razed to the ground. In 1831 the Reform agitation gave origin to riots that lasted for several days. The rioters destroyed various public and private buildings, among which was the Bishop's Palace, and a number of them lost their lives. Bristol was united as a bishop's see to Gloucester in 1837. The first bishop of Bristol and Gloucester united was James Henry Monk, created in 1837. By the Bristol Bishopric Act Bristol was again separated from Gloucester, and Dr. Forrest Browne was enthroned Oct. 28, 1897. Sebastian Cabot, Chatterton, and Southey were natives of Bristol. The borough is governed by twenty-one aldermen and sixty-three councillors, one of whom is mayor; and it returns since 1885 four members to Parliament, having formerly returned two. By the Extension Act, 1897, Bristol reached an area of 11,468 acres. The following neighbouring districts were brought in: Horfield (part), Stapleton, St. George, Brislington (part), Long Ashton (part), Easton-in-Gordano (part), Bedminster (part), Portbury (part), Portishead (part). The Bristol Extension Act, in addition to extending the area of the city of Bristol, operated as a consolidation act; the Bristol school-board administering the education acts, the guardians (sixty-three) of the parish of Bristol administering the poor-law, while justice is now administered by one court of summary jurisdiction, one court of quarter sessions, and one of assize. Pop. in 1861, 151,093; in 1871, 182,652; in 1881, 206,874; in 1891, 221,665; in 1901, 328,442.

BRISTOL, a seaport town, and capital of a county of the same name, in Rhode Island, United States, 56 miles s.s.w. Boston. It is a very pleasant town, finely situated, and handsomely built; has a safe and commodious harbour, and is a place of considerable trade. The trade is chiefly with the West Indies and Europe. This place is a favourite summer residence for those requiring or desiring fresh sea air. Pop. (1890), 5478.

BRISTOL CHANNEL, an arm of the Irish sea, extending between the southern shores of Wales and the Western peninsula of England, and terminating in the estuary of the Severn. It is about 90 miles long, and from 15 to 50 miles wide. It is remarkable for its high tides and the rapidity with which they rise. At Chepstow spring-tides rise as high as 60 feet. On its coast are situated the towns of Cardiff, Swansea, Ilfracombe, Tenby, &c.

BRITAIN, or rather *BRITANNIA*, was the name

which the Romans gave to modern England and Scotland. According to the testimony of ancient writers (especially Aristotle), the island in the remotest times bore the name of *Albion*. Until the time of Julius Cæsar Britain was probably never visited by the Romans. But the Phœnicians, Greeks, and Carthaginians, especially the first, were acquainted with it from a very early period, being accustomed to obtain tin here. Cæsar undertook two expeditions to Britain (55 and 54 B.C.). He defeated the inhabitants and continued a short time on the island. At this time the country was fairly populous, and in the south-east at least tolerably advanced in civilization. The people cultivated corn, owned numbers of cattle, were governed by petty kings or chiefs, employed war-chariots armed with scythes, and possessed ships that could take part in a sea-fight. Money had been coined by some of the tribes long before this time. Iron was moderately plentiful, and tin was exported. Most of the inland inhabitants grew no corn, but lived on meat and milk, and clothed themselves with skins. Druidism was an important institution. The ancient Britons were doubtless mainly Celts by race, but there may have been among them an Iberian element due to an earlier immigration. It was not until the time of Claudius (A.D. 43) that the Romans began the conquest of Britain. A great part of the country had been overrun by A.D. 62, when the revolt of Queen Boadicea (or Boudicca) and the entire overthrow of the Iceni occurred. Agricola, A.D. 78-85, completed the conquest of England and Wales and subjugated southern Scotland, running a line of forts across from the Clyde to the Forth. But the Romans were unable to retain their conquests in the northern part of the island, and were finally forced to abandon the fortified line between the Forth and Clyde, and retire behind a second wall built by Hadrian in 122 between the Tyne and Solway. A turf wall between Clyde and Forth was built by Antoninus Pius in 143, but Hadrian's wall remained the permanent boundary on the north. Thus the southern part of the island alone remained Roman and became specially known as *Britannia*, while the northern portion was distinctively called *Caledonia*. In 210 Roman Britain was divided by Septimius Severus into two provinces, *Britannia Superior* and *Britannia Inferior*. It was afterwards divided into four, and ultimately into five provinces, namely, *Britannia Prima*, *Britannia Secunda*, *Mazima Cæsariensis*, *Flavia Cæsariensis*, and *Valentia*. Under the dominion of the Romans, which lasted till early in the fifth century (see ENGLAND), flourishing towns arose, great roads were made, the useful arts and many of the refinements of life found their way into the southern part of the island, while Christianity was introduced and took the place of the Druidism of the native Britons. Thus from the time of the Roman conquest, and still more decidedly after the Saxon invasion of the fifth century, the history of Britain divides into a history of the southern part of the island, or England, and a history of the northern part, or Scotland, and it was not till the union of the crowns in 1603 that the destinies of England and Scotland were again united.

History of Great Britain.—The name Great Britain was applied to England and Scotland after James I. ascended the English throne in 1603, and we shall here give an outline of the history of the United Kingdom from that period. Under the articles ENGLAND, SCOTLAND, and IRELAND, the histories of the respective countries will be found.

With Elizabeth, who died in 1603, ended the line of princes of the house of Tudor. James VI. of Scotland, son of the unfortunate Mary Queen of

Scots, was the only near relation of Elizabeth (his great-grandmother, Margaret, was daughter of Henry VII. of England, grandfather of Elizabeth), and was named by her a short time before her death as her successor on the English throne. James was acknowledged without opposition; and thus two countries which had lived for ages in strife and bloodshed with each other, were henceforth linked together.

James was not destitute of natural abilities, and had acquired a more than ordinary share of literary knowledge, for which he was largely indebted to the celebrated George Buchanan. When he ascended the throne of England, the Episcopalians, the Roman Catholics, and the Puritans formed three antagonistic parties. The Catholics expected toleration from a prince who was born of Roman Catholic parents, baptized with the rites and ceremonies of the Church of Rome, and whose royal mother had died a martyr for the cause. The Puritans, on the other hand, expected that a monarch bred up in Presbyterian principles would naturally cast his influence in their favour; while the bishops awaited his accession with fear and trembling. But James soon dissipated the fears of the one, and the hopes and expectations of the other parties. He had acquired a strong dislike to the Presbyterian form of religion, while a desire of unlimited power and authority was the ruling passion of his heart, both of which he had carefully concealed while he reigned in Scotland. Instead of restraining, he increased the power of the Episcopal hierarchy; and some of the Roman Catholics were so provoked at the disappointment of their expectations of toleration at least, that they formed a plot for the purpose of cutting off, not only the king and his ministers, but the whole of his Parliament. This conspiracy, well known by the name of the Gunpowder Plot, was happily prevented, and the principal conspirators suffered that punishment which they had so justly merited.

England and Scotland were now ruled by the same prince, and James wished to make the union still more complete; but national animosities were not yet sufficiently extinguished, and national prejudices were too prevalent. It was James's misfortune that he had imbibed exalted notions of the royal prerogative, and wished to govern by the arbitrary maxims that had distinguished Queen Elizabeth; the glories of whose reign were, in the eyes of her subjects, some atonement for her occasional acts of despotism. But the nation, in consequence of the progress of political and religious knowledge, and the increasing diffusion of commercial wealth and prosperity through the whole community, was beginning to question the divine right of kings, and to wish for an extension of popular privileges. James's whole reign was therefore a continued contest between the prerogative of the crown and the freedom of the people. The Parliament refused to give supplies to a prince who was always reminding them of his prerogative, and who at the same time was destitute of vigour to enforce his pretensions. Accustomed as James had been, while he wielded the Scottish sceptre, to support the splendours of regal dignity upon a very slender revenue, it was reasonable to expect that when he ascended the English throne frugality would have been a marked feature of his royal rule; but his behaviour disappointed these expectations. Careful, though indeed from a constitutional timidity of character, to avoid wars, his system was entirely pacific during the whole course of his reign; yet his profusion was such that it uniformly exceeded his income; for he kept up three courts, one for himself, one for his queen, and a third for his son. Moreover, not content with bestowing upon his favourites the most lucrative offices of the state, and considerable grants

from the royal domains, he lavished upon them large sums of money. During his whole reign Ireland continued to be a heavy load upon England, occasioning large sums of money to be constantly remitted to support a standing army, which at one time amounted to 19,000 men, as also to supply the deficiencies of the Irish treasury. His wants, occasioned by his profusion, kept James engaged in constant disputes with his Parliament, who would not grant him money equal to his demands, and as a result he resorted to monopolies, loans, benevolences, and other illegal methods. Among other expedients he sold the titles of baron, viscount, and earl at the rates of from £10,000 to £15,000, and sometimes even £20,000. In his reign the hereditary title of baronet first originated. In 1611 ninety-three baronets were created, the sale of whose patents produced £98,550, or £1085 each. Yet of the £800,000 which Holland owed to Elizabeth, James was content to take the one-half, and he surrendered up the cautionary towns for a fourth of their value; and suffered the Dutch to dispossess the English of their factories in the East Indies. He also meekly consented to accept of £80,000 instead of £300,000, which Elizabeth had lent to Henry IV. of France; and in order to gratify the Spanish court he sacrificed the brave Sir Walter Raleigh. His ambition was more to shine as a theologian than as a prince; and he succeeded for a time in establishing Episcopacy in Scotland, though it by no means rested on a secure foundation. In fine, though the nation undoubtedly prospered in wealth and commerce, yet his reign was inglorious; and he died disliked by the majority of his subjects, in 1625, after a reign of twenty-two years over England, without having performed one great or glorious deed to exalt his own character or that of the nation.

His son Charles I., who succeeded, inherited the same exalted notions of royal prerogative, but was very different from his father in most respects. Religious and strict in his way of life, though somewhat cold and reserved, he could inspire respect and even affection. His marriage with a Roman Catholic princess (Henrietta Maria of France), who had perhaps undue influence over him, and his resolute adherence to arbitrary maxims and illegal methods of raising money without consent of his Parliament, gradually widened the breach between him and his subjects. His government grew more unpopular daily, and the Commons would vote no supplies without redress of grievances; which, instead of diminishing or complying with the wishes of his Parliament, and thereby soothing them into a more submissive temper, he constantly augmented by proceeding from bad to worse: dissolving Parliaments, imprisoning members, and raising prosecutions in the Star-chamber against the most popular characters in the kingdom. He intrusted the keeping of his conscience entirely to Laud, a narrow-minded bigot in church and state; who, in conjunction with Wentworth, earl of Strafford, entangled him in a most expensive and disastrous contest with his Scottish subjects, and afterwards with his Parliament, the latter encouraged by the successful resistance which the Scots had made to arbitrary power. When war actually broke out success at first was various; but the king was destitute of money to pay his troops, while the Parliament had at their disposal the whole resources of the nation. Charles was at last involved in such distress that he fled for protection to the Scottish army, which, in conjunction with the Parliament, maintained the struggle against arbitrary power. There he endeavoured, by various machinations, to sow dissension between them and the English Parliament, and to engage them in his

interest, but entirely failed in the attempt. The Scots had no intention of involving themselves in a war for the sake of a prince who had forfeited all confidence by keeping his word no longer than it suited his convenience, and therefore delivered him up to the Parliamentarian commissioners.

One part of the Parliament and of the nation were of opinion that now the constitution ought to be rectified; that the limits between the prerogatives of the king and the privileges of the people ought to be accurately determined; that after such salutary regulations the king ought to be restored to his throne, and to that share of power which was consistent with the happiness of his subjects; and that all past transactions ought to be buried in oblivion. But the Parliamentary army had reduced the king to subjection, and its leaders were loath to give up the power they had acquired; and they had also to consult their own safety, and could hardly trust to any engagement made by the king. Cromwell, equally noted for the dexterity, the vigour, and the success of his conduct, acquired an influence that nothing could resist. Under his guidance the army loudly declared for a commonwealth, and for the trial of the king, the invader of his people's rights. The king was tried: as might have been foreseen, he was condemned, and on the 30th of January, 1649, was beheaded before his own palace of Whitehall.

Cromwell's power in the army, and consequently in the nation, was supreme. The success of his schemes had perhaps exceeded his own expectation. He was dazzled with the splendour of a high station, pleased with the exercise of authority, and consequently unwilling to abandon that which he had so successfully acquired. The king had fallen before him; nothing remained but to overthrow the Parliament. This to Cromwell was no difficult undertaking. He went at the head of a chosen party of soldiers to the place where they were assembled, told them that 'the Lord had no more occasion for them,' turned them out of the house, and carried the keys along with him.

Had Cromwell assumed the title of king perhaps all his abilities might not have been able to withstand the fury of the party by which the very name of king was abhorred; but he had too much knowledge of human nature not to perceive that words have the greatest influence in the conduct of men. He knew he had the power of a king, and he was content with the title of Lord Protector. Under this appellation he exercised a more unlimited authority than had ever been exercised by any of the English monarchs. During the whole of his administration Cromwell retained that vigour and decision which had characterized him throughout the Parliamentary wars. He formed no system of politics by which he might regulate his transactions with foreign nations; but the promptitude of his measures, and the terror of his fleets and armies, rendered him no less respected abroad than he was at home. After a short reign, during which he endured all the miseries of grandeur and the anxieties of distrust, he died in 1658. Cromwell had so firmly established his authority that his son Richard was called to assume the authority of Protector; but Richard's temper was totally unlike that of his father. He preferred the calm of private life to the turbulence of power and the cares of ambition. The Republican party soon perceived that Richard could not, like his father, render himself formidable to them. They began, therefore, to resume the power which they had formerly possessed; and again arose that anarchy by which the nation had formerly been convulsed. In such revolutions the opinion of the people at large is seldom consulted. Harassed by commotions which had long prevailed, the nation hated equally the

tyranny of a protector and the anarchy of a pretended republic. The restoration of their old constitution, and of their former race of monarchs, was the general desire. Taking advantage of this prevalent disposition, General Monk, who had commanded under Cromwell, and who was now at the head of a considerable force, formed the resolution of restoring Charles, son of Charles I. Monk was compelled to temporize, lest the Republicans should suspect his designs; but such was the caution with which he took his measures, and such the general disposition of the nation, that in 1660 Charles was recalled and placed on the throne, under the name of Charles II. In the measures of a crowd there is seldom moderation; and such on this occasion was the enthusiasm of loyalty that the king was restored to the throne without any restraint upon his authority, and without any attempt to define the prerogatives of the crown and the privileges of the people.

Charles II. seems to have profited little by his father's misfortunes. More attached to the pleasures of life than anxious faithfully to discharge the duties of his office, he appears to have considered sovereignty chiefly as an acquisition by which he could, with more ease, indulge himself in licentiousness and profligacy. Had the House of Commons been sufficiently liberal in their grants, and not very scrupulous in demanding an account of the manner in which these grants were expended, Charles would, perhaps, have permitted them to conduct the affairs of the nation in the way most agreeable to themselves. But the Commons were parsimonious. The king, resolved on satisfying every passion, scrupled not in order to obtain money to adopt the most illegal measures. The Parliament began once more to express that jealousy of the kingly prerogatives which had formerly involved the nation in so much confusion. The king continually demanded supplies; the Parliament answered him by remonstrances regarding his conduct. The Duke of York, brother to the king, and heir-presumptive to the crown, had openly declared himself a Roman Catholic, a circumstance than which nothing could more excite the national terror. The Commons persisted in withholding supplies; the king became daily more needy, more peevish, and less scrupulous in his conduct; and at length, perceiving that he was to expect from his Parliament only reproaches, he dismissed it, resolving never to assemble another; and from that moment managed the reins of government in a manner altogether arbitrary.

The English, and indeed every nation of Europe at this time, seem to have been anxious to humble the growing power of France; but in this respect the opinion of Charles was different from that of his people. The French monarch supplied Charles with money, of which he was continually in want, and thus engaged him in hostilities with Holland. The naval power of the Dutch was at that time truly formidable. Only the English could pretend to rival them at sea. Many engagements were fought with uncommon obstinacy and consummate skill; and though the Dutch, seizing a favourable opportunity, sailed up the Thames and insulted their enemy in her own harbours, the naval strength of the English was gradually acquiring an irresistible superiority, and establishing that power which has since become altogether unequalled.

Charles died February 6, 1685, and as he left no lawful issue, his brother, the Duke of York, succeeded to the throne, under the name of James II. During the life of Charles, James had always asserted the doctrine of passive obedience; and that he might the more evince his sincerity, he practised in his life that doctrine of which he inculcated the be-

lief. What he so willingly had yielded to his sovereign he hoped his subjects would have no aversion to yield to himself; and he proceeded to act with all the perverse obstinacy of a narrow mind. To render himself still more odious he exerted that power which he pretended to be unlimited in a design than which no other could be more generally abhorred: he laboured to establish in his dominions the R. Catholic faith. His design was opposed with a vigour which ought to have convinced him that it was impracticable; but opposition served only to intensify his determination and to render him more obstinate. Matters soon came to such a situation that it was evident that the monarch intended to establish Popery at the risk of his own ruin. In this extremity the nation turned their eyes to William, Prince of Orange, celebrated for his military capacity and his political virtues. Though this prince was nephew, as well as son-in-law to James, he eagerly accepted an invitation to enter the kingdom for the purposes of relieving the people from their apprehensions of Popery, and bringing the infatuated monarch to a more reasonable mode of action. No sooner had William landed than James was deserted by almost all his remaining adherents. Forgetting that bravery which he had exhibited when Duke of York, in his engagements with the Dutch, he resolved, according to the advice of some who pretended to be his friends, to leave the kingdom. He fled to France. The throne was declared vacant. After some debates the Prince of Orange and his wife, the Princess Mary, were called to be the King and Queen of England. The people, convinced by the transactions of their preceding monarchs that the surest way of securing the peace of the nation was to define the power of the prince and the privileges of his subjects, adopted a mode of conduct which ought to have been followed at the Restoration. They framed the Bill of Rights, which fixed the English government in that state of freedom and moderation which has since so happily characterized it. This important revolution was effected in 1688.

Though the revolution had been brought about with much appearance of unanimity, and though it secured to the nation inestimable privileges, the accession of William III. did not meet with universal acquiescence, nor had James lost all his friends. In Ireland particularly, as it abounded in R. Catholics, that unfortunate monarch had many adherents. James appeared among them in person, and was soon at the head of an army; but William, by gaining the battle of the Boyne, annihilated James' hope of restoration. William prosecuted hostilities with France, with various success, till the battle of La Hogue (1692) made an impression on the French navy which it could never afterwards recover. The English had defined the privileges of their kings; but they found that war could not be conducted without more money than they were willing to grant: what the king could not procure as a gift he borrowed; and at this time the funding system began to be considered as a national resource—a system which the British ministers have been careful not to forget.

After a reign in very few respects remarkable, William, in 1702, was succeeded by Anne, daughter of James II. and the next Protestant heir to the throne. Anne's administration was distinguished by the violent animosities of the existing factions; but in the midst of these an important measure was passed—the union of England and Scotland. These countries had since the time of James I. been governed by a single sovereign; but they had separate Parliaments, and indeed might still justly be called separate and independent kingdoms. It had often been proposed, by a union, to consolidate the power of the island;

but every proposal for that purpose had hitherto been unsuccessful. This measure, of so much importance to each of the countries, was resumed by Anne; and after a violent opposition, particularly by the Scots themselves, the English and Scots were, in contradiction to the decided opinion of a majority of the latter, declared to be one people. Thus, in 1707, England and Scotland ceased to be distinct kingdoms; and the island was distinguished by the appellation of the United Kingdom of Great Britain. This union, however it might be opposed by the prejudices, and even by the immediate interests of particular men or particular ranks of men, when it was first effected, has certainly contributed much to the prosperity of the empire. Britain has thus attained an importance at which England and Scotland, while separate kingdoms, could never have arrived. The Act of Union consisted of twenty-five articles, among which the following deserve notice. It was agreed that the succession to the kingdom of Great Britain should remain as it had formerly been settled for England. That Britain should have only one Parliament; and that all rights and privileges should be common to both nations, except where otherwise expressly agreed. That in all parts of Britain the English coin, weights, and measures should be considered as the standards. That the laws relating to trade, customs, and excise should be the same in both parts of the kingdom. That to the House of Peers the Scots should send sixteen representatives; and that the number of the Scottish members in the House of Commons should be forty-five. That all the Scottish peers should be peers of Britain; and that, except sitting in the House of Lords and voting on the trial of a peer, they should have all the privileges of peers. That the Established Churches of England and Scotland should remain unaltered, and be considered as forming an essential part of the union. A general clause reserved to the united Parliament the power to alter these articles for the benefit of Scotland; and under cover of this clause some fundamental changes were afterwards made. Though the union of England with Scotland tended ultimately to increase the power and importance of both, yet it was not immediately followed by any important result. The measures of the nation, both in foreign and domestic policy, continued in a great degree unaltered.

The British arms, under the command of Marlborough, had succeeded in checking the ambitious designs of Louis XIV.; but a party at home, instigated partly by envy at the renown which Marlborough had acquired, partly by considerations of the inutilty of all continental conquests, and of the immense taxes which the acquisition of such empty celebrity brought upon the nation, and irritated too by the evident coldness of the continental powers in a quarrel which was properly their own, loudly demanded peace, and steadfastly counteracted all the designs of Marlborough and his friends. Harley and Bolingbroke at last succeeded in supplanting him in the favour of the queen. The command of the army was taken from him, and given to the Duke of Ormond; and after many negotiations at Utrecht, a treaty was signed by the belligerent powers on the 31st of March, 1713. By this treaty the British right of sovereignty over Hudson's Bay, Newfoundland, Nova Scotia, Minorca, and Gibraltar was acknowledged. The peace which had just been concluded was extolled by the Tories in the most unqualified terms; whilst by the Whigs it was censured in terms no less unqualified. The remainder of Anne's reign was distracted by the never-ending alterations of domestic parties. She died on the 1st of August, 1714; and with her ended the line of the

Stuarts, who had swayed the sceptre of England 112, and that of Scotland 343 years.

It has been supposed by some that Anne intended to have used her influence in altering the line of succession; but either she had formed no such design, or she had not abilities to carry it into effect. At her death George I., elector of Hanover, maternally descended from Elizabeth, daughter of James I., according to the Act of Settlement, ascended the throne of Britain. The Whigs under this prince regained that superiority in the national councils of which they had long been deprived. George was greatly attached to his paternal continental dominions, and in the struggle of the two factions was often accused by the Tories of sacrificing the interests of Britain to those of Hanover. The suspension of the Habeas Corpus Act, and some other extreme measures, increased the irritation of the weaker party, and in 1715 the standard of rebellion was erected in the Highlands of Scotland by the Earl of Mar, who proclaimed the Chevalier St. George, the heir of the family of Stuart, king. A few persons in the N. of England, under the Earl of Derwentwater, joined in the same design, and proclaimed the Pretender at Morpeth and Alnwick; but the attempt was feebly conducted, and tended only to the ruin of those who had engaged themselves in so hopeless an undertaking. The Duke of Argyle in the N., and General Wiles in the S., dispersed the forces of the rebels; and the Chevalier, accompanied by Mar, Drummond, and a few other persons of distinction, made their escape to the Continent.

In 1718 an alliance, known by the name of the Quadruple Alliance, was formed between Britain, France, Germany, and Holland; and of this alliance a rupture with Spain was the immediate consequence. In 1718 Sir George Byng engaged and captured the Spanish fleet in the Mediterranean. The Spaniards endeavoured to retaliate by despatching a powerful armament to support the claims of the Pretender in Britain. But the fleet was entirely dispersed by a storm off Cape Finisterre; and the Earls Marischal and Seaforth, and the Marquis of Tullibardine, who had been landed in Scotland, with difficulty made their escape again to the Continent. In 1720 the Irish Parliament was deprived of its right of final jurisdiction, and thus rendered dependent on that of Britain. In the same year the South Sea Company obtained an act to increase their capital by redeeming the public debts. The greater part of the nation now became stock-jobbers, and South Sea stock rose to £1000 per cent. This extraordinary rise was followed by an equally sudden depression; and the shares fell to 150 per cent., and many families were ruined by their connection with the scheme. The Parliament, which met in 1722, had its attention engrossed by new reports of real or pretended plots in favour of the Pretender. Lyster, a young templar, was convicted and executed, and Atterbury, bishop of Rochester, banished on the charge of being connected with this conspiracy. Hoister's unfortunate expedition to the West Indies to intercept the Spanish galleons was one of the last events of George's reign. He died at Osnabruck on the 11th of June, 1727, in the sixty-eighth year of his age.

George II. inherited his father's partiality for his continental dominions as well as his crown. He continued Sir Robert Walpole, who had been minister to his father, at the head of the treasury. The British monarchs had now learned to act on principles of policy different from those of their predecessors. They were now convinced that to oppose openly the will of Parliament was to plunge themselves into inevitable destruction. Instead, therefore, of opposing the House of Commons, they now endeavoured

by every means to procure in that assembly a majority favourable to their designs. Walpole is said to have been the first minister who resorted to the employment of undue influence in elections. But whatever were the means which he used, he successfully engaged the nation in all the schemes of their sovereign. It was soon discovered, however, by the other nations of Europe, that the British minister would sacrifice almost every interest to his attachment to peace; and under this impression of his character the arms of Britain, formerly so much dreaded, were now treated with something that approached to contempt. Walpole, like every man in power, had many enemies; and this part of his conduct was eagerly seized to degrade the minister in the opinion of the public. The failure of an attempt on Carthage, together with other unfortunate naval operations, completed Walpole's disgrace. And in the meantime the Prince of Wales, having differed with his father, and consequently with the minister, became the leader of the opposition. The minority, animated by so illustrious a leader, acquired new boldness; the election of a new Parliament approached, and the influence of the prince filled it with Walpole's enemies. Unable longer to maintain his ground, the minister resigned; and as a reward of his services was created Earl of Orford. But the succeeding administration following the steps of its predecessor, became equally unpopular.

The German Empire at this time was involved in many troubles. By a treaty between several of the continental powers known by the name of the Pragmatic Sanction, the succession to the whole of Charles' dominions had been insured to his daughter; but the treaties of princes are binding only while they are supported by the force which made them. The emperor was no sooner dead than different parts of his dominions were seized by the surrounding potentates, and in a short time the whole German territory was a scene of warlike tumult. In these commotions there was nothing materially to interest Britain; but Hanover was threatened, and the British monarch was anxious to rescue from the danger of invasion his paternal dominions. A numerous army was therefore equipped for an expedition to the Continent; and George, among whose faults cowardice could not be numbered, having put himself at its head, encountered the French at Dettingen, and obtained a complete victory. France now threatened Britain with a new invasion in favour of the Pretender; but Sir John Norris, with a superior fleet, kept their armament in check. The battle of Fontenoy decided the French preponderance on the Continent; but Admirals Rowley and Warren supported the honours of the British flag at sea.

A fresh attempt was now made to restore the Stuart family to the throne of Britain. Charles Edward, son of the Pretender, having been furnished by France with a small supply of money and arms, landed on the coast of Lochaber, in the Western Highlands, in 1745, accompanied by the Marquis of Tullibardine, Sir John Macdonald, Sir Thomas Sheridan, and other adventurers. Marching southwards with 1500 Highlanders, he caused his father, then resident in Rome, to be proclaimed king at Perth. His force increasing as he advanced, he entered Edinburgh without opposition; and having defeated Sir John Cope, near Prestonpans, marched into England, accompanied by the Earl of Kilmarnock, Lords Elcho, Balmerino, Ogilvy, and Pitaligo, and the eldest son of Lord Lovat. Having taken the town and castle of Carlisle, he advanced through Lancaster, Preston, and Manchester, to Derby, within 100 miles of London; but finding himself disappointed of expected succours from France, and the English

Tories, contrary to his expectations, keeping aloof, he commenced his retreat into Scotland, closely pursued by the king's troops, whom he again defeated at Falkirk. With this victory his good fortunes terminated. The Duke of Cumberland having arrived from the Continent—where he had gained considerable military experience—put himself at the head of the forces which were destined to check the rebels; and the armies having met at Culloden, near Inverness, Charles was completely defeated. The fugitive prince, after lurking for six months amidst the wilds of Inverness-shire, and trusting his life to the fidelity of numerous individuals, at length, with much difficulty, escaped with Cameron of Lochiel in a vessel which his friends had hired for the purpose. The abolition of the heritable jurisdictions in 1748 laid a solid foundation for the civilization and improvement of the Highlands.

The war on the Continent, in the meantime, continued with undiminished fury. The success was various; but the British and their allies—of whom some were unwillingly engaged in the contest—were generally unfortunate. The success of the British at sea, however, compensated for their disasters on land; for though Boscawen, in the East Indies, failed in performing what was expected of him, yet Hawke, Anson, and several other naval officers, reduced the French navy to a degree of extreme insignificance. Both parties, however, had reason to desire peace. A negotiation to this effect was opened, and in 1748 a peace was concluded at Aix-la-Chapelle, the basis of which was a general restitution of conquests. Pelham, who continued to be the chief person in administration, and who enjoyed an uncommon share of popularity, showed himself worthy of the national support, by adopting and encouraging every scheme which could forward the national prosperity. Under his administration trade acquired a vigour which it had never formerly attained; and notwithstanding the enormous expense which had been incurred in the war just terminated, and the consequent accumulation of the national debt, the credit of government had not been injured. On the contrary, Pelham succeeded in reducing the interest of the public debt from 4 per cent., first to 3½, and afterwards to 3 per cent. The colonization of Nova Scotia, and the alteration of the style according to the Gregorian calendar, by merging the eleven days between the 3d and 14th of September, 1752, were among the most remarkable events which took place during the short interval of peace. At the same time the 1st of January was fixed as the opening day of the year, instead of the 25th of March, which, being the first day of the ecclesiastical year, was up to this time considered by many as New-Year's Day.

To diminish the trade of Britain now became one of the chief aims of her continental adversaries, in order to enable them to renew the war with a greater probability of entire success. But the great object of the French was to straiten the boundaries of the British colonies, and, if possible, either to wrest them from the mother country, or to involve them in unavoidable ruin. With a view to the execution of this purpose, the French used every art to ingratiate themselves with those Indian tribes by which the British settlements in America were surrounded. Antimonies which in some cases were already excited, and for which there existed plausible reasons, were inflamed into implacable resentments. To give the greater efficacy to their designs the French built forts upon different parts of the inland frontiers, and took every opportunity to render the situation of new settlers extremely perilous. An army of experienced troops was also collected, and

was about to be embarked for America, where, as they had little to defend, they must undoubtedly have intended to become aggressors. But the British ministry had for some time foreseen that war would be unavoidable, and the proposed embarkation of troops seemed to be an evident signal for commencing hostilities. Without waiting therefore till the French declared war, Boscawen was despatched with a fleet to the American coast, where he took two French men-of-war, and chased the rest of the fleet up the river St. Lawrence. At the same time orders were issued for seizing the vessels of France wherever found; and before the end of 1755, about 500 of them, together with about 8000 sailors, were in the possession of Britain; and before the conclusion of 1757, 30,000 French seamen were made prisoners. In 1755 General Braddock was sent to attack the French forts upon the inland frontiers of the American settlements; but he suffered himself to be surprised by an ambuscade near Fort Du Quesne. General Johnson attacked the French near Crown Point, on the Lake Ontario, and was more successful than the unfortunate Braddock. In 1758, after various inferior transactions, the British made themselves masters of Frontenac and Fort Du Quesne, as well as of Loueburg, and of the chief French settlements in North America. Near Ticonderoga, indeed, the British were again defeated; but the attack made by Wolfe on Quebec in 1759 was completely successful. Wolfe purchased his victory and his reputation with his life; but Monkton and Townshend, who succeeded him, ably supplied his place; and Amherst soon overran the whole of Canada, and almost annihilated the colonial empire of the French. The latter had not confined their undermining acts of policy to America. In the East Indies also they had carefully ingratiated themselves with the native powers, and incited them to engage in hostilities with the British. Their success in this undertaking, however, was, if possible, less than in America. The British arms under Clive were so completely successful in every quarter, that the power and influence of Britain in the East were more than ever extended, and the foundation laid of our magnificent empire in that quarter. The French were driven from their few India possessions, and have never been able to re-establish their importance in that part of the world. But the exertions of the British were not equally successful in the Mediterranean. Byng, with a fleet at least equal to that of the French, having been encountered and defeated by La Galissonière, was tried for cowardice, and shot on board the fleet at Portsmouth; and General Blackney, in consequence of Byng's failure, was compelled to abandon Minorca. About this time Mr. Pitt was introduced into the administration. This minister adopted a new system of operations against France by fitting out an expedition to carry the armies of Britain into her enemy's country. It sailed under Mordaunt, on the 8th of September, 1757, but returned without effecting anything; and the French, having attacked the Electorate of Hanover, compelled the Duke of Cumberland to sign a disgraceful capitulation. In the following year his Britannic majesty entered into a treaty of mutual defence with Prussia, and the Hanoverian forces under the Prussian general drove the enemy from their dominions. France now projected another invasion of her great rival's country; but towards the conclusion of 1759, when the invasion was to be attempted, the Toulon fleet was defeated by Boscawen, and the Brest fleet by Hawke. In 1760 George II. died, and was succeeded by George III., his grandson.

When George III. succeeded to the throne, he was extremely willing to procure peace to his dominions; but it was judged prudent to continue hostilities until

terms honourable and advantageous to the country could be procured. The French were by no means willing to accede to such conditions as the British thought due to their success in several parts of the world; and for the purpose of making a more formidable impression on Britain, a compact had been formed among the branches of the Bourbon family to unite in carrying on the war. This rendered it necessary to declare war against Spain, hitherto pretending to be neutral, but on every occasion almost openly espousing the cause of France. When Spain took part in the war, an invasion of Portugal from that country was immediately attempted; but, by the assistance of a party of British troops, the Spanish arms were soon repelled. Hostilities, in the meantime, were carried on in Germany with undiminished fury, and generally to the advantage of France; but the unsuccessful exertions of the British upon the Continent were more than compensated by their acquisitions in other quarters of the world. They had already taken from the French all their possessions on the American continent; and their colonies in the West Indies now experienced the same fate. The French islands of Martinique, Grenada, the Grenadillas, and St. Vincent were taken possession of; and Havana, the most important West Indian fortress belonging to the Spaniards, was wrested from them. The conquest of Pondicherry completed the degradation of the French arms in the East; and the reduction of Manila placed the Spanish possessions in a perilous state. These acquisitions were important, and the enemies of Britain, compelled by her numerous conquests, now acceded to terms sufficiently advantageous to the British. The French relinquished all their possessions on the continent of North America; and the whole of that continent, to the E. of the Mississippi, was yielded to Britain. The islands of Martinique, Guadeloupe, Mariegalante, and Desadea (Desirade) were yielded to the French; the island of Cuba, to Spain; the other conquered islands were allowed to remain in the power of the British; the possession of Senegal, in Africa, was secured to Britain; and Goree was yielded to France. The East India Company restored to the French all their possessions in Asia, on condition that they should maintain neither forts nor troops in Bengal; and Manila was resigned to the Spaniards, who in return allowed the British to cut logwood in the Bay of Honduras. In Europe everything was restored to that state in which it had been before the war. This peace was concluded in Paris on the 10th of February, 1763.

The terms of this treaty were not such as the country had expected. Pitt, who had retired from office some time before, characterized it as 'obscuring all the glories of the war, surrendering the dearest interests of the nation, and sacrificing public faith, by an abandonment of its allies.' Lord Bute, 'the new favourite,' as he was called, felt himself unable to keep his ground as premier against the opposition, now composed of the ablest and most distinguished men of the country, and, making a merit of necessity, gave in his resignation, and was succeeded by Grenville. A general coalition of parties was soon after attempted, but without success, and party spirit raged with more keenness than ever. Among the political publications of the day, the North Briton, edited by John Wilkes, member of Parliament for Aylesbury, was distinguished by its boldness and virulence. A prosecution was commenced against its author, but the proceedings instituted against him only tended to establish him more and more as the idol of the people. The new minister, however, got Parliament, after a hot debate, to declare the forty-fifth number of the North Briton 'a false, scandalous, and seditious libel;' and after this petty

triumph, plunged himself into new and still more threatening difficulties. During the war, which had been undertaken chiefly for the defence of the colonies in America, upwards of £72,000,000 had been added to the national debt. When the ardour of conquest had abated, the payment of the interest of a debt so enormous excited many complaints. It appeared to the people of Britain to be extremely just, that the Americans, on whose account great part of the debt had been incurred, should assist in the payment of the interest. The Americans, on the other hand, did not deny the justice of subjecting the colonies to taxes, but insisted that if the British Parliament claimed the right of taxing the colonists, these colonists had a right to be represented in Parliament, in order that, like other British subjects, they might be taxed only in consequence of their own consent. Grenville, however, was tenacious of his purposes, and introduced a bill for imposing certain stamp-duties on the American colonies and plantations. General Conway and Colonel Barré in vain opposed the measure, and protested against the right thus assumed by the legislature; the minister carried his point, and the memorable decree went forth, which proved such a monument of British folly. Grenville's party, however, was shortly after this supplanted by the Rockingham administration, which effected an important concession to the American colonies; but its measures gave offence to a high personage; and Pitt, now advanced to the peerage by the title of the Earl of Chatham, was directed to form a new ministry. The new administration renewed the foolish plan of taxing the colonies; and, on Lord North's introduction into it, Lord Chatham again retired from office. Nothing could be more impolitic and unfortunate than North's administration for twelve successive years. The act of 1767, imposing certain port-duties, was followed by the appointment of an American board of commissioners; and all the representations and complaints, as well as the demonstrations of excited feeling on the part of the Americans, were utterly lost on the infatuated ministry. In 1775 Lord Chatham's bill for settling the troubles in America was rejected by a majority of sixty-one to thirty-two voices; and next day Lord North moved an address to the king, declaring America in a state of rebellion. The humiliating result of the struggle which now ensued betwixt the mother-country and her colonies was such as the wise foresaw. Meantime London, in the month of June, 1780, exhibited a frightful scene of confusion and riot, in consequence of the popular agitation on the subject of the Roman Catholic Relief Bill, fomented by the insane conduct of Lord George Gordon. A heavy misfortune was also experienced this year, in the capture, by the Spaniards, of the East and West India fleets in the Bay of Biscay. The famous confederacy established by the Empress of Russia, under the name of the Armed Neutrality, aimed a severe blow at our continental connections at this juncture; and the appearance of Hyder Ali in the East threatened the safety of our possessions in India. The raising of the siege of Gibraltar, the taking of St. Eustatia, the action betwixt the Dutch and British fleets on the Dogger-bank, and the capture of a large part of the French Indian fleet, form the principal events in the concluding years of North's administration, who was driven from the helm in 1782.

The Marquis of Rockingham, as first lord of the treasury, and the Earl of Shelburne and Charles Fox, as secretaries of state, had conducted the new administration for a short period, when the death of the former nobleman led to new ministerial arrangements, and Pitt, the younger son of Lord

Chatham, was appointed chancellor of the exchequer. On the 30th of November, 1782, the long-protracted struggle betwixt Britain and her American colonies was brought to a close by the signing of provisional articles of peace at Paris. But ministerial propositions having been rejected in the meeting of Parliament after the recess, a resignation followed, and the celebrated coalition ministry, with the Duke of Portland as first lord of the treasury, and Lord North and Fox as secretaries of state, was organized. This ministry enjoyed a mere ephemeral existence. On the rejection of the India Bill, the two secretaries were required to deliver up their seals of office, and a new ministry was appointed on the succeeding day, at the head of which Pitt, then only twenty-four years of age, was placed as first lord of the treasury and chancellor of the exchequer. The affairs of Ireland and India, and the impeachment of Hastings, were among the first subjects which occupied the attention of Pitt's ministry. A treaty of defensive alliance between Great Britain and the United Provinces, and a similar treaty with Prussia, were signed in 1788. The discussion on the Regency Bill engrossed the attention of Parliament in the ensuing session.

The situation of France in the following year presented an object of engrossing and overwhelming interest to all Europe; nor was Britain the least interested spectator of that extraordinary moral and political revolution which now convulsed her hereditary foe. Burke's *Reflections on the French Revolution*, Paine's celebrated *Rights of Man*, and Mackintosh's *Vindiciæ Gallicæ*, contributed not a little to direct and inflame the zeal of the conflicting parties in this country, whose violence in several instances carried them far beyond the bounds of moderation. On the execution of Louis, an order was issued for the departure of the French ambassador at the court of London within eight days; and war was declared by the National Convention of France against Britain and Holland, on the 1st of February, 1793. The British ambassador had indeed been recalled from Paris during the insurrections which occurred in that city in the autumn of the preceding year; but the declaration of war proceeded in the first instance from Paris. A speedy termination of the struggle, in favour of the allied powers, was certainly anticipated by Pitt before he lent himself to the coalition against France; but it soon appeared that the national resources of France had been greatly underrated. These, joined to the national enthusiasm, and in the hands of able and vigorous-minded men, were such as enabled France, single-handed, to contend successfully against all Europe. The career of her armies, under such men as Bonaparte, Moreau, Kleber, and Hoche, was everywhere triumphant; and on the conclusion of the peace of Campo Formio, in 1797, Britain stood alone in the conflict. But the war now becoming strictly maritime, her attitude, not less strikingly than that of France in 1794, exhibited the advantage possessed by a nation when combining its resources on its proper element. In this first great contest France and Britain were placed successively in opposition to a confederacy of the other European powers, and successfully resisted the fearful odds brought against them; each nation also added largely to its territorial possessions; and each, though exhausted, continued capable of prolonging the contest.

The naval successes of Jervis off St. Vincent and Duncan off Camperdown were followed, when Napoleon led an expedition into Egypt having India as its ultimate object, by the victories of Nelson in Aboukir Bay and Abercromby at Alexandria, the latter costing the commander's life. In 1798 a

rebellion in Ireland, fomented by a body whose aim was to employ French assistance in securing Irish independence, had to be crushed. Peace was made in 1802 by the Treaty of Amiens, only to be broken by another declaration of war in 1803, as the ambitious projects of Napoleon became evident. In spite of the efforts of Pitt (who died in 1806) in the way of forming and supporting with funds a new coalition against France, the military genius of Napoleon, by a series of great victories, culminating in Austerlitz and Jena, swept away all opposition on land, though the naval victory of Trafalgar (1805), in which the greatest of British seamen fell, established Britain's supremacy at sea. Napoleon, who had assumed the title of Emperor of the French in 1805, and was now virtually the ruler of Europe, put forth his Berlin decrees in 1807, prohibiting all commerce with Britain wherever his power reached, set his brother Joseph on the throne of Spain, and occupied Portugal. But the spirit of resistance had now taken deep root in the British people, and the offers of peace made at Erfurt, by the Emperors of Russia and France, were rejected by the British government. In 1808 troops were sent into Spain under Sir John Moore, and a year later Wellington, then General Wellesley, landed in Portugal. Then began that famous series of successful operations known as the Peninsular War, which drove back the French into their own country, and contributed greatly to the ultimate downfall of the immense fabric of Napoleon's conquests. The main features of this war were the crushing defeat of Marshal Victor at Talavera; Wellington's formation of the celebrated lines of earthworks, the lines of Torres Vedras, by which he protected Lisbon and held the French armies under Masséna in check until he had accomplished the liberation of Portugal, and his subsequent victorious march through Spain, marked by many brilliant successes such as the capture of Almeida, Ciudad Rodrigo, and Badajoz; the defeat of Marmont at Torres, near Salamanca; the brilliant victory at Vittoria (1813); and the capture of St. Sebastian. In the spring of 1814 the tide of battle rolled through the passes of the Pyrenees into the south of France, where this great struggle was concluded by the crowning victory of Toulouse. Paris was occupied by the allies in 1814, and Napoleon was deposed and exiled to Elba. The restoration of the Bourbons in the person of Louis XVIII. followed the expulsion of Napoleon, and the French received a constitution based upon liberal principles. Britain gave back, without hesitation, all her French conquests, with the exception of Tobago, St. Lucia, and the Isle of France (Mauritius). At the same time she retained, of her Dutch conquests, the Cape of Good Hope and Dutch Guiana; of her Danish, Heligoland; and of her Italian, Malta; and she also obtained the protection of the Ionian Isles. Her acquisitions, in respect to territorial possessions and political importance, were therefore very great; especially as, at the same time, her East Indian dominions were increased by the acquisition of the territories of the King of Candy; so that the whole of Ceylon became subject to the British crown. Hanover likewise received considerable additions, and the name of a kingdom. On February 26th, 1815, Napoleon left the place of his exile, was joined by an army, and entered Paris on the 20th March. He sought to prevent the union of the Prussian troops of Blücher with the Anglo-Belgic force under Wellington, and to destroy both; a plan which, had it been successful, would have re-established his power. On June 18th he met and defeated the Prussians at Ligny, but his plan failed, and his own army suffered a crushing and final

defeat at Waterloo on the 18th of the same month, and thus the great struggle terminated.

The political attitude of Britain had been for twenty-three years warlike. But victory brought bitter fruits even to Britain, which, after several years of peace, came to maturity. A debt, of which the capital amounted to more than forty years' revenue of the kingdom, and internal disturbances which threatened the greatest danger, demanded from the ministry the most cautious and judicious measures. The absurd opinion that war opens up such sources of prosperity to a country as compensate for the resources which it consumes had been contradicted by experience. Frugality and forbearance from all superfluous expense, particularly from war, have therefore been, since 1815, a guiding principle with most British governments, and the policy of Britain has become as peaceful as it had formerly been warlike. Britain formally opposed the principle, maintained by some of the other European powers, that the European association of states has a right to put down by force any attempt on the part of the people of an existing government to overturn it, namely, the right of *armed interference*, as it is called; and on the entrance of Canning into the department of foreign affairs, after the suicide of Londonderry, the British withdrew from the continental system of politics.

After the termination of the wars with Napoleon, notwithstanding the economy of the government, particularly shown in the reduction of the army, so great a burden was left upon the nation, and the bad harvests of 1816 and 1817 had made the necessities of the working-classes so urgent that this section of the nation was reduced to despair. A corn-law passed in 1815 aggravated the seriousness of the situation, by prohibiting the importation of wheat until the price had reached 80s. per quarter. Discontent was expressed not merely in words but in acts. Riots were burned, machinery destroyed, and other measures, indicative of dangerous unrest, were resorted to by those on whom the troubles of the time lay heaviest. But the most important element in the situation was the rapid revolution in industrial conditions which was then in progress, and to the immediate results of this change much of the wretchedness of the lower and poorer classes was due. The various alleviating agencies, such as the enforcement of factory regulations and the growth of trade-unionism, which were later to spring from that revolution, were not then in existence, at least as effective forces; and thus large numbers of the working-classes were left exposed to the full fury of an unaccustomed change in industry at a time when even under normal conditions their lot would have been a hard one. In June, 1819, disturbances began in the manufacturing districts. Meetings were held, in which annual parliaments and a radical reform in the election of members were the great topics of declamation. The well-known Hunt was conspicuous on these occasions. The assemblies went so far as to choose delegates for a new parliament; and no one knew what a mob of many thousands might undertake next. Serious measures were therefore adopted. Such a mob at Manchester (Aug. 16, 1819) was dispersed by the authorities of that place by means of a military force. On this occasion many persons were killed and wounded. The authorities were reproached, not only with having used force without necessity, but also as having violated the forms of law. Judicial proceedings were instituted against them, which ended with their acquittal. These violent excitements continued to assume every day a more dangerous character, and the ministry were compelled to propose to

Parliament, at the end of the year, certain extraordinary measures, which were adopted by the Parliament, and were to be continued for five years. They consisted of five articles: 1, a prohibition of private military exercises; 2, of the possession of weapons; 3, of the liberty of holding meetings of the people without the permission of the local authorities; 4, a more rigorous punishment of libels, and of seditious or irreligious writings; lastly, 5, the acceleration of judicial proceedings in case of small offences.

The long reign of George III. came to an end by his death on January 29, 1820, his successor being his son George IV. The dangers of radicalism vanished, as peace, the consequent diminution of taxes, the increased demand for manufactures abroad, particularly in Spanish America, better harvests, and cheaper means of living, again improved the situation of the manufacturers. The renewal of specie payments, by which the value of the paper currency was increased, was also of great effect, and was particularly favourable to the manufacturers. The last convulsion of this disorder was the conspiracy of a band of desperate men, under the conduct of Arthur Thistlewood, a man who had sunk from a respectable standing by misconduct, to assassinate all the ministers. They were betrayed. Thistlewood and four of the other conspirators were executed, and four others were transported for life to Botany Bay.

If much revolutionary spirit had really existed in Britain, and given occasion to these disorders, instead of their having sprung, as they did, merely from want, it would have taken a very dangerous turn at the time of the trial of the queen. This trial, which was brought on by faults and passions on both sides, and in which all regard to female dignity and princely honour was trodden under foot, gave a new pretext, a new rallying-point, to the discontented. It began, upon the return of the queen to England (June 6, 1820), by a message to the Parliament to inquire into her conduct; whereupon a ministerial motion followed, proposing an injudicious personal penal law (bill of pains and penalties), discreditable to the British legislature. The purport of the bill was, that Queen Caroline had forfeited the title, rights, and prerogatives of a queen of England, and that her marriage with the king was to be regarded as dissolved. The shameful charges brought against the queen in Parliament were retaliated by the most bitter satire upon the king. The opposition among the people to this measure was so great, that the ministers dared not bring into the lower house the bill passed in the upper. The time was likewise too dangerous, as the revolutions in Spain, Portugal, and Naples followed each other in quick succession.

The assassination of the Duke of Berry (Feb. 13, 1820), the Cato Street conspiracy (Feb. 23), were important symptoms. The crisis in Britain, however, passed quickly over. The disturbances among the manufacturers ceased as their wants were alleviated; the popularity of the king was re-established by a journey through his dominions; and the queen was almost forgotten when she died, Aug. 7, 1821. See GEORGE IV.

But much more serious disorders, in the internal relations of Great Britain, appeared (1822), and showed the consequence of that disproportion which exists in the British Islands between the great landed proprietors and the actual cultivators of the ground. The property of the soil is in comparatively very few hands. Besides the clergy, who possessed about 6000 estates, and the corporations, whose possessions might be reckoned at an equal number, there were then in England but about 20,000 landholders. The British law, which gives to the eldest son all the real estate, is itself sufficient to keep together large

masses of landed property; but the pressure of war has done still more. In 1786 there were 250,000 landed proprietors. The small farmers are now, almost without exception, tenants; of whom Mr. Coke alone had 500 around him. In Scotland, the ancient common possessions of the clan have passed to the chief. In Ireland the ancient proprietors were almost all displaced by the confiscations of Elizabeth, Cromwell, and William III., and their landed estates divided among a few English families. Besides their own possessions, the Established clergy in England have tithes from almost all real estate. In 1818 the high price of corn had sunk; and in 1820 the value of money was increased by the renewal of specie payments at the banks: so that ruin threatened the tenantry (in England the strength of the nation, and in Ireland the great mass of the people), from their inability to fulfil the terms of their leases, which had been made when the value of money was less. In England they expected general poverty. In Ireland a famine arose, in consequence of a bad harvest. In Scotland large numbers were expelled from their places of residence. One proprietor (in April, 1820) removed 800 families from their holdings, in the county of Ross: in the county of Sutherland, the Marchioness of Stafford did the same towards 15,000 persons, turning their farms into sheep-walks, for the sake of greater profit! In England, this state of the agricultural population excited far more anxiety than the disturbances of the manufacturing districts, because it affected a more important and energetic part of the nation, and sprung from a deep and permanent cause; but the means proposed to remedy the evil were very various. The ministry pointed out, as the true case of this evil, the abolition of the income tax by act of Parliament, which they had, even in 1816, declared a victory of the rich over the poor, the consequences of which were now developed. By this victory all personal estate, the revenue from capital and from the colonial possessions, were exempted from taxation; in consequence of which the burden fell almost entirely upon the working-class, and on the consumption of the necessities of life. The assertions of the opposition, that the distress of the country was the consequence of the excessive taxes, were indeed not without foundation; but all the possible means of saving, particularly the abolition of sinecures, including clerical ones, could have afforded no real remedy, which was to be looked for in a more equal division of taxes,—a measure as disagreeable to the opposition as to the ministerial party. No one even dared to propose the obvious measure, of the reduction of rents, in proportion to the rise in value of the paper, consequent upon the resumption of specie payments by the bank. This increase in value amounted to 15 per cent; and the rents should have been reduced in proportion. Some proprietors, indeed, did reduce the rents of their tenantry 10, 15, and even 30 per cent; but we cannot say what proportion they bore to those who did not.

Great Britain was neutral during the French invasion of Spain, in 1823; allowed her subjects to aid the cause of Greece, and acknowledged the Greek insurgents' right of blockade. She concluded a treaty of trade and alliance with the new American republics, which she formally acknowledged in 1825. A bill for the removal of the Catholic disabilities was brought forward in this session, and passed the House of Commons, but was lost in the House of Lords; and the disorders in Ireland continued. Between 1824 and 1826 a war was carried on with the Burmese, which resulted, in the latter year, in the cession of Aracan and the Tenasserim Provinces to the East India Company.

In 1825 and 1826 great commercial difficulties

took place, in consequence of a mania for speculation in foreign loans, and in costly undertakings, conducted by joint-stock companies, together with an overloading of foreign markets with British manufactures. Numerous bankruptcies took place, and credit experienced a great shock. Ministers availed themselves of this opportunity to mitigate the strictness of the corn-laws. (See CORN-LAWS.)

The sympathies of all Christendom having been outraged by the events of the war going on between the Turks and Greeks, the British cabinet entered into an arrangement with Russia, to compel the Porte, dissuasion failing, to cease hostilities against its Christian subjects. On April 13, 1827, the Canning administration was formed, the French government soon after acceded to the Greek protective alliance, and a Turco-Egyptian fleet was annihilated by the allied fleet in the battle of Navarino, Oct. 20. Previously (Aug. 8) Canning died, and the premiership devolved on Lord Goderich. Jan. 8, 1828, the latter resigned, and the Duke of Wellington formed a Tory cabinet, which abolished the Corporation and Test Acts; and in April, 1829, allowed the Catholic Relief Bill to pass. June 26, 1830, George IV. died, and was succeeded by his brother, the Duke of Clarence, who took the title of William IV. Next month, a revolution and change of dynasty took place in France, which had a great effect in strengthening the ever-growing desire for reform in Britain. The duke, having expressed a determination to resist all radical changes, was outvoted on a critical question, and (Nov. 16) retired from office, when a reform administration succeeded, headed by Earl Grey. Lord John Russell brought in the first Reform Bill, March 1, 1831; but it was rejected. A second bill passed in the House of Commons, and finally a third bill was successfully introduced. (See section on parliamentary reform below.) The next great public measure was the abolition of slavery in every British possession, by an act passed Aug. 1, 1834. Other acts of great importance passed during William's reign were the Poor Law Amendment Act of 1834, and the epoch-making Municipal Corporations Act of 1835, now superseded, with all its amending acts, by the more recent act of 1882. William IV. died June 20, 1837, and was succeeded by Victoria, daughter of the Duke of Kent, the fourth son of George III. The accession of the queen caused the separation of the kingdom of Hanover from that of England, for, in virtue of the law which excluded women from the Hanoverian throne, her uncle, the Duke of Cumberland, became king of that country. Queen Victoria was crowned on June 28, 1838, and was married to Prince Albert of Coburg-Gotha, Feb. 10, 1840. Their eldest son, now Edward VII., was born on the 9th Nov., 1841. The reign of Victoria was specially noteworthy for social legislation and its association with the development of the great self-governing colonies. In 1846 the efforts of the Anti-Corn-Law League were crowned with success in the bill by which Sir Robert Peel inaugurated the free-trade policy of Britain. The famous Chartist movement was in full vigour during the first decade of the reign. (See CHARTISM.) In 1833 an act had been passed to limit the hours of children's labour in factories, and this was followed during the forties by several acts, culminating in the Ten Hours Act of 1847, which may be regarded as closing the first phase of factory legislation. To the same period belong the two noteworthy movements in the Scottish Churches, by which were formed the Free Church (1843) and the United Presbyterian Church (1847), since 1900 joined together as the United Free Church of Scotland. The part of the late queen's reign that

preceded the middle of the century was darkened by wars in Afghanistan and elsewhere, and in 1837-38 the government had to deal with a rebellion in Canada. In 1861 (May 1) the Crystal Palace, or great museum of the world's industry, was opened. In 1852-53 dissension arose regarding the rights of the Latin and Greek Churches to preferable access to the 'holy places' in Palestine. The Emperor of Russia, resenting concessions made to French devotees, sent Prince Menschikoff to Constantinople, to demand redress for the pretended wrong. The result was a war in which Russia was opposed to Britain, France, and Turkey. The Crimea became the chief seat of the war, though military operations were also carried on between the Turks and Russians on the Danube, and several naval expeditions were sent to the Baltic. (See the article CRIMEA.)

Scarcely was the Crimean War over when Britain was threatened with the loss of her possessions in India through the mutiny of the Sepoys; but within eight months there were 70,000 British troops in India, and by the end of 1858 the rebellion was entirely crushed. (See INDIAN MUTINY.) One result of the mutiny was that, by a bill passed Aug. 2, 1858, the sovereignty hitherto exercised over the British possessions in India by the East India Company was transferred to the crown.

Before the mutiny was at an end Britain was engaged in hostilities both with China and with Persia. In the Chinese war the British were assisted by the French, and the war ended with the treaty of Tien-tsin (1858), by which five Chinese ports were opened to trade. The Persian war, which was of little importance, arose from the interference of Persia with Herat. The Chinese soon broke through the treaty of Tien-tsin, and hostilities were resumed. Peking was surrendered to a French and English force, and a fresh treaty made, Oct. 1860. Shortly before this began the volunteer movement which has been so successful. The civil war in America, between 1861 and 1866, had a most injurious effect on one of the most important British industries. It almost entirely stopped the supply of raw cotton, and in consequence of this a large number of hands engaged in the cotton manufacture, chiefly in Lancashire, were thrown out of employment and reduced to the greatest distress. (See COTTON FAMINE.) A matter which grew out of this war was the Alabama question, which for some years caused a good deal of bitterness of feeling between England and the United States, until it was settled by arbitration at Geneva in 1872. (See ALABAMA.) The society calling itself the Fenian Brotherhood, which had for its object the separation of Ireland from the United Kingdom, caused no little alarm between 1861 and 1867. (See FENIANS.)

Another step in the direction of parliamentary reform was taken by the government of the Earl of Derby in 1867, when a bill to establish household suffrage became law. (See particulars given below.) Two events worthy of mention marked the colonial and foreign policy of Lord Derby's government. One was the passing, in 1867, of a bill for the formation of the Dominion of Canada; the other was the sending out of an expedition to Abyssinia for the release of the British consul and the European missionaries who had been imprisoned by King Theodore. The expedition started in the autumn of 1867, and effected its object in the spring of 1868, but not before Lord Derby had retired from office owing to failing health. His successor was Mr. Disraeli, who had previously been chancellor of the exchequer under Lord Derby. A general election held in 1868 having left Disraeli's party opposed to an immense Liberal majority, he tendered his resign-

nation (Dec. 2, 1868), recommending Mr. Gladstone as his successor. The administration of Mr. Gladstone was distinguished by a series of measures which made important changes both in church and state. The session of 1869 saw the passing of a bill providing for the disestablishment and disendowment of the Irish Church on the 1st of Jan. 1871. In 1870 the Irish Land Bill, having for its object the regulation of the relations between landlord and tenant, became law; and during the same session an act of Parliament establishing a national system of elementary education for England was passed. In 1871 the purchase of commissions in the army was abolished by the use of the royal prerogative. Next followed the Ballot Act (1872), at first limited to eight years, but afterwards made permanent, and the Scotch Education Act (1872). Early in 1874 Mr. Gladstone dissolved Parliament, and a large Conservative majority being returned to the new Parliament, Mr. Disraeli (afterwards Lord Beaconsfield) again became premier. The Ashantee war, begun the previous year, was brought to a successful termination early in 1874. In 1876 the title of Empress of India was added to the titles of the queen. The growth of the sentiment known as imperialism is usually dated from about this time, and the impulse towards it is largely to be attributed to Disraeli. During the Russo-Turkish war of 1877-78 Britain remained neutral, but took an important part in the settlement effected by the Berlin Congress, and acquired from Turkey the right to occupy and administer Cyprus.

The Afghan war of 1878-79 and the Zulu war of 1879 belong to the closing years of Lord Beaconsfield's administration. The general election of 1880 gave the Liberals a large majority. Mr. Gladstone again became premier, and during his five years' ministry the following amongst other acts were added to the statute-book: a new Irish Land Act (1881); an act for putting down crimes in Ireland (1882); Corrupt Practices Act (1883); a new reform act equalizing the borough and county franchise (1884); and a Redistribution of Seats Act (1885), the last two secured by an agreement with the opposition leaders. The annexation of the Transvaal, carried out in 1877 by the previous ministry, led to war with the Transvaal Boers in 1880-81. Before this war had proceeded far the British troops in Natal had met with serious reverses at Laing's Nek and Majuba Hill, and (as the Orange Free State threatened to join the Transvaal) Mr. Gladstone thought it prudent to conclude peace with the Boers on the basis of a limited independence of the Transvaal. The limitations were largely done away with in 1884, and the Transvaal became known as the South African Republic. The rebellion of Arabi Pasha in Egypt in 1882 led to the bombardment of Alexandria by the British fleet and to military operations in northern Egypt; and the revolt in the Soudan under Mohammed Ahmed, known as the Mahdi, led to the separation of the southern provinces from Egypt. The failure to relieve Khartoum and save General Gordon contributed largely to make the ministry unpopular. A new parliament was elected in the end of 1885, and for a brief period Lord Salisbury was premier, but in Feb., 1886, he made way for Mr. Gladstone. The Liberal leader had now determined to adopt the plan of Home Rule, which had for some time been demanded by Irishmen, and in 1886 he introduced his first Home Rule Bill. On its defeat in the Commons he appealed to the electorate, who declared against it, and Lord Salisbury again became prime minister. The most important acts passed under the second Salisbury administration

were the Local Government (England and Wales) Act (1888) and Local Government (Scotland) Act (1889), which established county councils; and the Free Education Act (1891). At the general election of 1892 the Home Rule party obtained a small majority in the House of Commons, and Mr. Gladstone entered on his last term of office. His second Home Rule Bill (1893) passed the lower House, but was rejected in the House of Lords. Of the measures which became law under this administration the most notable are the Local Government Act of 1894, under which Parish and District Councils were formed; and the Finance Act of 1894, which made important changes in the death duties. Mr. Gladstone's health compelled him to resign the premiership in 1894 (four years before his death), and Lord Rosebery then became head of the government. A general election took place in 1895, with the result that the Conservative-Unionist party obtained a very large majority. Lord Salisbury again formed a ministry, under which the chief statutes and events were the following: Agricultural Rates Act (1896); the Education Act (1897), giving greater financial assistance to voluntary schools; Workmen's Compensation Act (1897), superseding and extending the Employers' Liability Act of 1880; the Vaccination Act (1898), a partial concession to the opponents of vaccination; the Local Government (Ireland) Acts (1898 and 1900), extending to Ireland the system of local government enjoyed by England and Scotland; the recapture of Khartoum and the reconquest of the Egyptian Soudan (1898); the settlement of the Venezuela boundary dispute by arbitration (1899); and the Commonwealth of Australia Constitution Act (1900), by which the federation of the Australian colonies was finally accomplished. Early in October, 1899, war broke out with the Boer republics of South Africa, a war which has proved to be perhaps the most serious waged by the country since Waterloo. (See SOUTH AFRICAN WAR.) Fighting also took place in 1900 in Ashantee and China. (See CHINA.) Towards the end of 1900 Lord Salisbury appealed to the country, and a new general election gave his party a majority of about one hundred and thirty. On Jan. 22, 1901, took place the death of Queen Victoria in her eighty-third year. Her jubilee (1887) and diamond jubilee (1897) had been celebrated with great pomp and rejoicing, and her death was not only the cause of sorrow throughout the whole of the widespread British Empire, but called forth tributes of sympathy from all civilized peoples. Her reign of sixty-three and a half years is the longest in the history of the United Kingdom, and witnessed greater material and intellectual progress than any previous one. She was succeeded by her eldest son, Albert Edward, Prince of Wales, now Edward VII. He was married in March, 1863, to Princess Alexandra of Denmark (now Queen Consort), and their son, Prince George, has become heir-apparent. Edward VII. was crowned on Aug. 9, 1902.

CONSTITUTIONAL HISTORY, GOVERNMENT, &c.—The British constitution is in nearly every important respect unique. It is a conspicuous instance of gradual evolution, resulting in the end in the creation of a system of law and government superior in comprehensiveness, in stability, in elasticity, to any of the numerous constitutions drawn up on what were supposed to be the most enlightened and logical principles. One of the best examples of the characteristically English development of important institutions entirely outside of written law or formal legislative enactment is the position occupied by such a body as the cabinet, a body never officially recognized by any act of parliament, and wholly unknown to the written law,

yet practically the highest executive body in the kingdom, though nominally the executive government is vested in the sovereign. On this subject the late Mr. Bagehot remarks: 'The efficient secret of the English constitution may be described as the close union, the nearly complete fusion, of the executive and legislative powers. According to the traditional theory as it exists in all the books, the goodness of our constitution consists in the entire separation of the legislative and executive authorities, but in truth its merit consists in their singular approximation. The connecting link is the cabinet. By that new word we mean a committee of the legislative body selected to be the executive body.' The English constitution does not exist written in any single document, nor even in a few or in many documents; much of it, indeed its most vital and important part, is based on custom hardened into inviolable precedent, and is in a sense unwritten. The principal sources of British constitutional law have been arranged under four heads, namely: (1) Treaties or quasi-treaties, (2) the precedents and customs known as common law, (3) compacts, and (4) statutes. The last is at the present day practically the only method by which the British constitution may receive additions and modifications, and to its scope there are no theoretical limitations. The treaties of constitutional importance are the Act of Union with Scotland, passed in 1707, and the Act of Union with Ireland, passed in 1800, each consisting really of two statutes, and these created the United Kingdom and the Imperial Parliament. The second source, customary law, though unwritten in a sense, is now embodied in a mass of judgments, opinions of eminent lawyers, and other similar documents. It includes—and this is most characteristic of English institutions—many of the most important matters of public polity, such as the organization and inter-relationships of the crown, cabinet, lords, and commons. The compacts refer to the powers of the crown considered as distinct from and opposed to the nation, and include the Great Charter of 1215, the Bill of Rights of 1689, and the Act of Settlement of 1700, which have been called 'the title-deeds of English political liberty'. They have something of the character of ordinary statutes, but differ in the peculiar part played by the king in respect to their provisions. The great extension of the franchise brought about by recent statutes and the introduction of voting by ballot have had the effect of giving the constitution far more of a democratic character than formerly, with what result in further legislation remains to be seen. The existence of a body of hereditary legislators is objected to by many, but the question of 'ending or mending' the House of Lords can hardly as yet be said to have become a 'burning' one.

The Sovereign.—Under the title of a constitutional and hereditary monarchy the government of Britain is vested in the sovereign and the two houses of Parliament—the House of Lords and the House of Commons. The fundamental maxim upon which the right of succession to the throne depends is, that the crown is, by common law and constitutional custom, hereditary, and that the right of inheritance may from time to time be changed or limited by Parliament; under which limitations the crown still continues hereditary. It descends to the males in preference to the females, strictly adhering to the rule of primogeniture. The sovereign is of age at eighteen years. The heir to the crown has, since the time of Edward III., inherited the title of Duke of Cornwall, and receives that of Prince of Wales by letters patent. The power of the sovereign is limited by the laws. The divine right, so obstinately main-

tained by the Stuarts, was never recognized by the nation, and William III., Mary, and Anne ascended the throne, according to express declarations, only by virtue of a transmission of the crown to them by the nation. One of the most important attempts to override the law by the authority of the crown was the abuse by James II. of the dispensing power, an infringement of the ancient liberties of the realm which was one of the chief causes of the Revolution of 1688. The maxim has, however, been acknowledged, particularly since the Restoration, that there is no power in the state superior to the royal prerogatives; the acts of the king are therefore subject to no examination, and the king is not personally responsible to any tribunal: hence the maxim, The king can do no wrong. Yet there is sufficient provision for confining the exercise of the royal power within the legal limits. 1. All royal acts are construed in accordance with the laws, and it is taken for granted that the king can never intend anything contrary to law. 2. The counsellors of the king are responsible for the royal acts, and, as well as all those who are concerned in the execution of them, are liable to impeachment and examination, without the right of defending themselves by pleading the royal commands. 3. The Parliament and the judicial tribunals have also the right to discuss freely such royal acts, and, in particular, Parliament and each individual member of the upper house, has the right to make remonstrances to the crown. 4. Individuals are protected from any abuses of the royal power by the Habeas Corpus Act of 1879, the liability of the agents to prosecution, the right of complaining to parliament, recourse to the courts of justice, and the liberty of the press. The Habeas Corpus Act was not an enactment of a new principle, but rather, like several other great measures in English history, a redeclaration, accompanied by stringent regulations, of a long-recognized though often violated principle. The same purpose is served in Scotland by the Wrongful Imprisonment Act of 1701. A sovereign determined to use the extensive power ascribed to him under the constitution could, in spite of these safeguards, cause considerable trouble to Parliament and the nation, but revolution remains as a last resort. For long, however, and especially during the reign of Victoria, the crown has virtually left the business of the country in the hands of the legislature and the officers of state.

The king is the supreme head of the state in peace and war, the lord paramount of the soil, the fountain of justice and honour, and the supreme head of the church. The supreme headship of the church as belonging to the sovereign dates only from the ecclesiastical changes of Henry VIII.'s reign. The king also has the prerogative of rejecting bills in Parliament, which, however, has not been exercised for some two hundred years. As the generalissimo, or the first in military command within the kingdom, he has the sole power of raising and regulating fleets and armies, which, however, is virtually controlled by the necessity he is under of obtaining supplies from Parliament. As the fountain of justice, and general conservator of the peace of the kingdom, he alone has the right of erecting courts of judicature, and all jurisdictions of courts are derived from the crown. As the fountain of honour, of office, and of privilege, he has the power of conferring dignities, privileges, offices, &c. In the foreign relations of the nation he is considered the nation's representative, and makes treaties, declares war, &c. As advisers he has the privy-council and the cabinet. The former of these developed out of the old Anglo-Saxon Witenagemot through its feudal equivalent, the Commune Concilium, but the latter

as already indicated, is a much more recent and far more important development. We can trace germs of a cabinet under Cromwell and Charles II., but it did not really assume its distinctive form till after the great revolution. Under William III. and his immediate successors it grew in power, reaching a culminating point under Walpole. During the earlier years of the reign of George III. it declined, but with the younger Pitt and his successors it again took an important place in the political system; and since then it has grown steadily in power until now it has virtually gained the right of determining the bills to be submitted to Parliament. In the cabinet are included all the greater officers of state, such as the first lord of the treasury, the secretaries of state for foreign affairs, for the home department, for the colonies, and for India, and others, and thus the cabinet is in reality at the head of the administration. Consequently it forms a link between the legislative and executive departments of the state, as above pointed out.

The Parliament.—The origin of the Upper House of the British Parliament has been sought rightly enough in the *Witenagemot* (literally 'meeting of the wise men') or national assembly of the Anglo-Saxons, which under some of the kings had much the character of a royal council. In a somewhat different form, due to its adaptation to feudal territorial conceptions, the *Witenagemot* was continued in the Norman times. Gradually, however, the Great Council, as the Witan was called under the Norman kings, began to divide into sections, owing to the great increase in its business which took place after the Conquest. Its judicial functions were step by step separated from its legislative and executive and its financial work, and from this separation, begun under Henry I., greatly advanced under Henry II., and completed in its main features under Edward I., arose several of the leading elements in the national constitution. The Exchequer represents the Great Council as the supreme financial body, the Courts of King's Bench, Common Pleas, &c., continue its judicial functions, the Privy Council retains in part its administrative character, whilst the House of Lords, though retaining a small portion of the judicial authority of its progenitor, mainly performs another function virtually inherent in the Great Council, that of legislation. For the origin of the Lower House, or House of Commons, we must look elsewhere, namely, to the old shire-courts, which originally dealt only with local affairs, but latterly sent elected representatives to a central body to act for them in national affairs, and especially to provide the necessary taxes. When the boroughs increased in importance and numbers they were similarly represented; and in De Montfort's parliament of 1265 there appeared representatives not only of the greater barons, including the greater ecclesiastics, but also of the shires and of the boroughs. In the Parliament summoned by Edward I. thirty years later the same mode of representation was carried out in a more thorough manner. The shire and borough representatives, though at first distinct, gradually coalesced, and thus the Parliament came to be regarded as including *three estates*, now known as the lords spiritual, the lords temporal, and the commons. In the reign of Edward III. (1327-77) the separation of the estates into two houses—the House of Lords, consisting of the lords spiritual and the lords temporal, and the House of Commons, consisting of the knights, citizens, and burgesses—became settled, though the time at which the Commons began to sit as a separate assembly is not definitely known. The upper house is thus an older institution than the lower. All the peers were not originally en-

titled to a seat as a matter of right, but only those who were expressly summoned by the king. Every peerage of the U. Kingdom conferred now, however, gives the right of a seat in the House of Lords or Upper House. The number is indefinite, and may be increased at the pleasure of the crown, which, however, cannot deprive a peer of the dignity once bestowed. The Upper House at present comprises about 580 members. By the act of union with Scotland, 16 representatives of the Scottish peerage are elected by the Scottish nobility for the duration of each parliament, and 28 are elected for life by the peers of Ireland. No parliamentary measure can become law till it has passed the House of Lords as well as the House of Commons. In the upper house the lord-chancellor presides, holding the position of the speaker in the Commons, with this difference, that he has the right to take part in debate as an ordinary member of the house. All grants of subsidies or parliamentary aids must originate with the House of Commons, and the Lords have not the right to amend, but only to accept or reject, a money bill. The Parliament is not permanent, and it is the royal prerogative to summon and dissolve it. As the Parliament is summoned, so it is prorogued, by the royal authority. A dissolution of Parliament is effected either by the authority of the crown or by length of time. The House of Commons being chosen but for seven years, at the expiration of that time Parliament is dissolved *ipso facto*. The lower house of Parliament has the direction of all financial concerns; and there is perhaps no subject which may not be brought before it by petition, complaint, or motion of a member. The upper house is the supreme court of judicature in the nation. In civil cases (as now represented by the Lords of Appeal in Ordinary) it is the supreme court of appeal from the superior tribunals of the three kingdoms. In indictments for treason or felony, or misprision thereof, where the accused is a peer of the realm, the House of Lords are the judges of the law and the fact. In cases of impeachment by the House of Commons the House of Lords are also the judges. All the forms of a criminal trial are then observed, and the verdict must be by a majority of at least twelve votes. The House of Commons is in no sense a court of law, and, powerful as it is, it cannot revise, amend, or in any way interfere with a judgment duly given in a court of law. (As regards procedure, &c., in Parliament see PARLIAMENT.)

Parliamentary Reform.—The House of Commons in the first Parliament of Henry VIII. consisted of 298 members, a number largely increased by royal charters and by the Acts of Union, which gave 45 members to Scotland and 100 to Ireland. Just previous to the Reform Bill of 1832, therefore, it consisted of 558 members, of whom 513 were for England and Wales, 45 for Scotland, and 100 for Ireland. In this representation there were great injustices and anomalies. Many of the boroughs had quite fallen into decay, so that a place like the famous Old Sarum, which consisted only of the ruins of an old castle, sent two members to Parliament, while great manufacturing towns like Manchester and Birmingham were absolutely without representation. Not only the *rotten boroughs*, as these decayed constituencies were called, but also in many cases the towns, in which the right of suffrage belonged to a small number of freeholders, were practically in the hands of a single family, and in this way a few great houses—Norfolk, Bedford, Devonshire, and the Pelhams, &c.—commanded more than 100 seats in parliament. For the few places that were in the hands of independent voters a shameless system of bribery existed, in spite of the

prohibitory laws, and the prices of votes were generally well known: a seat for a small place cost about £5000. This state of matters led to long-continued agitation for parliamentary reform, and ultimately, on March 1st, 1831, Earl Grey being then premier, Lord John Russell introduced a plan of reform proposed by the government. On the 22nd the English bill passed its second reading in the Commons by a majority of one, but the government suffered defeat in committee on a proposal not to reduce the number of members for England and Wales. A dissolution followed, but the Whigs again came into power under the same prime minister, and on June 24th Lord John Russell brought his second Reform Bill before the newly-elected House. This bill, in which the proposed diminution of the number of English members was abandoned, finally passed the Commons on Sept. 21st by 349 to 236, but was rejected by the Lords by 199 to 158. On Dec. 6th, when Parliament met after the prorogation, a third Reform Bill was introduced by Lord John Russell, and passed the Commons on March 23rd, 1832. In the Upper House the government was defeated on an amendment proposed by Lord Lyndhurst, whereupon Earl Grey asked the king either to create sufficient new peers to carry the bill, or to accept his resignation. The latter alternative was adopted, and the Duke of Wellington undertook the impossible task of forming an anti-reform ministry. On May 18th the Whigs were reinstated with the assurance of being provided with the means of passing the bill, and finally it passed the Lords by 106 to 22, owing to the absence of many of the opposition, who did not want to force the creation of new reform peers. The royal assent was given on June 7th. The Reform Bill of 1832 brought great changes. Occupiers of lands or tenements in counties at a yearly rent of not less than £50, and occupiers as owner or tenant of a house or shop in a borough of a yearly value of £10, now received the franchise. Fifty-six rotten boroughs were wholly disfranchised; 30 boroughs were deprived of 1 member; and 1 borough (Melcombe-Regis cum Weymouth, which had 4) of 2 members; 22 boroughs were created in England, to return 2 members each, and 20 boroughs to return 1 member each. Besides taking away the right of election from many insignificant places, and vesting it in large, or at least in tolerably populous constituencies in new boroughs, the act introduced something like uniformity in the qualifications of the voters of the old boroughs and cities, and extended the elective franchise from close corporations, or privileged bodies, to the citizens at large.

The Reform Bill had not been long in force when a further extension of the franchise began to be demanded. After several unsuccessful attempts by Lord John Russell, Lord Palmerston, and Mr. Gladstone to pass reform bills, in 1867 Mr. Disraeli, then chancellor of the exchequer, succeeded in carrying through a bill which conferred the borough franchise on all householders who had resided in the borough for twelve months previous to the last day of July in any year, and had been assessed for and paid poor-rates, and on all lodgers who had occupied for a like period lodgings of the yearly value of £10 unfurnished. In 1868 the franchise was bestowed on occupiers as owners or tenants of subjects of £12 rateable value, and the copyhold and leasehold franchise was reduced from £10 to £5. This bill related only to England and Wales, but bills of a similar character were passed for Scotland and Ireland in the following year. In this way the electorate, which was 1,352,970 in 1867, rose to 2,243,259 in 1870, but the total number of members still remained at 658. To Manchester, Liverpool, Birming-

ham, and Leeds were assigned three members each, and to London University one. Populous counties were further divided, and to many of the divisions two members each were given. This act, though in some ways it did not effect so great a change as that of 1832, is of even greater importance, since it may be regarded as marking the beginning of the present democratic system of representation.

From the union of Scotland with England in 1707 till 1832 the former returned 45 members to the House of Commons, 30 for the 33 counties, and 15 for 15 districts of burghs. Superiors, or persons holding directly from the crown, alone voted in the counties. In two counties there were only three real voters in each. The number of persons who actually voted at the elections of the burghs was very inconsiderable, consisting, in general, of the magistrates and town council, amounting only to 20 in each burgh, or in all the 66 burghs to 1320. By the Scotch Reform Act of 1832, 8 members were added to the representation; Edinburgh and Glasgow receiving 2 each, and Aberdeen, Dundee, Greenock, Perth, and Paisley 1 each. The right of voting was also placed as near as possible on the same footing as in England; but the number of members, though increased, was not in proportion with those allotted to England, or even to Ireland. By the Scotch Reform Act of 1868 the burgh franchise was assimilated to that of England, being conferred on householders, but in counties the occupation tenure was £14 or upwards. Seven additional seats were given: 1 to the universities of Aberdeen and Glasgow jointly, 1 to those of Edinburgh and St. Andrews (the university electors being the members of the general councils), 1 to Glasgow city (which now had 3), 1 to Dundee (which now had 2), and 1 each to the counties of Lanark, Ayr, and Aberdeen, which were divided into two divisions, each returning a member.

Since the legislative union with Britain in 1801 Ireland had sent 100 members to the House of Commons, 64 for the 32 counties, 2 each for Dublin and Cork, 1 each for 31 other cities and boroughs, and 1 for Dublin University. By the Reform Act of 1832, 5 members were added, namely 1 each to the towns of Belfast, Galway, Limerick, and Waterford, and 1 to the university; and £10 copyholders, &c. were admitted amongst the classes of county voters. In 1850 occupiers of land rated at £12 a year were admitted to vote. In the borough franchise the £10 qualification for owner or occupant was adopted in the reform of 1832, much the same as in England; and by the act of 1850 the franchise was further extended to £8 occupiers. By the Reform Bill of 1868 the occupation franchise in towns was reduced from £8 to £4, and for lodgers it was fixed at the same as in England and Scotland.

The Representation of the People Act of 6th Dec. 1884 established a uniform householder and a uniform lodger franchise throughout the kingdom, and increased the electorate by about two-and-a-half million voters. Equally important changes were effected by the Redistribution Act passed in June 1885. By it 79 small boroughs in England and Wales (including four districts of boroughs in the latter) and 24 in Ireland ceased to return members separately, while in Scotland the Haddington and Wigtown districts of burghs lost the burgh franchise. In England 36 small boroughs, and in Ireland 3, lost one member each. The members for Liverpool were increased to 9, for Birmingham, the Tower Hamlets, and Glasgow to 7 each, for Manchester to 6, for Leeds and Sheffield to 5 each, and other important centres in proportion. Thirty-three new boroughs, chiefly in the London Metropolitan dis-

triot, were created. Many of the larger boroughs were divided and a member given to each division; large counties were dealt with in a similar way. The numerical strength of the house was also raised, the gross number of members being 670, of which England gets 466 (2 additional), Wales 30 (as before), Scotland 72 (12 additional), and Ireland 103 (2 less). The following is a summary of the distribution of members according to the act of 1835:—

England	4 counties with 2 members each, 5 with 3 each, 9 with 4 each, 5 with 5 each, 4 with 6 each, 5 with 7 each, 5 with 8 each, Lancashire with 23, Yorkshire with 26, Rutland and Isle of Wight with 1 each	234	466
	8 cities and boroughs with 1 each, 28 with 2 each, 9 with 3 each, and 5 with 4 each	137	
	Leeds and Sheffield 5 each, Manchester 6, Birmingham and Tower Hamlets 7 each, and Liverpool 9	39	
	Universities	5	
	8 counties 1 each, 3 with 2 each, Glamorgan 5	19	
Wales	7 districts of boroughs 1 each, Swansea and Merthyr Tydvil 2 each	11	30
	23 counties with 1 each, 5 with 2 each, Lanarkshire 6	30	
Scotland	16 burghs with 1 each, 2 with 2 each, Edinburgh 4, Glasgow 7	81	72
	Universities	2	
	21 counties with 2 each, 8 with 4, 1 with 7, 1 with 1, 1 with 3	85	
Ireland	6 boroughs with 1 each, 2 with 4 each, 1 with 2	16	103
	University	2	
Total,		670	

Ranks and Titles.—The laws acknowledge only two distinctions of rank or civil status, the nobility and the commonalty. The distinction is by no means like that between the patricians and plebeians in ancient Rome, nor that between the nobles and citizens of France in the eighteenth century, and the peculiar privileges of the nobility are few and insignificant. Intermarriages with commoners are usual, and the sons of peers mingle with commoners in the House of Commons, where wealth, talent, and industry are at least as well represented as birth. Moreover, the House of Lords is continually recruited from the general body of commoners by the conferring of peerages on distinguished men. The peers are exempted from the performance of certain unimportant public services, such as sitting on juries, &c. They have also a right to be tried by the House of Lords on indictments for treason, or felony, or misprision thereof; but the administration of justice before this tribunal is as strict as in the ordinary courts. Their persons cannot be arrested in civil cases. The titles borne by those who form the peerage are, in a descending scale, duke, marquis, earl, viscount, baron. Of these, earl is the oldest, this title dating from the Anglo-Saxon period, when it was equivalent to that of *ealdorman* or governor of a shire. (See *Anglo-Saxons*.) After the Conquest the title of *baron* came into use. The *barons* formed an inferior class of nobles to the earls, though the term was also used to include all tenants-in-chief. The title of *duke* arose under Edward III., who created his eldest son Duke of Cornwall (1337). The title of *marquis* was introduced in the time of Richard II.; that of *viscount* during the reign of Henry VI. It is only the actual holders of these titles who are, strictly speaking, the nobility; their families are only noble by courtesy. The chief privilege that the titles confer is a seat in the House of Peers or—since the term *lord* is often used as equivalent to *peer*—the House of Lords. The Scottish and Irish peers sit in the house only by deputation; but many Scottish and Irish peers have also titles

belonging to the peerage of Great Britain or the United Kingdom in virtue of which they sit; thus, the Marquis of Lothian sits as Baron Ker. The titles of nobility just mentioned are inherited by the eldest son, who, during the life of the father, as a rule bears by courtesy his next highest title if he is a duke, marquis, or earl; if the father be a viscount or baron, the son is only an 'honourable'. (See *TITLES OF HONOUR; ADDRESS, FORMS, &c.*) Any of the sons of a duke or marquis is called *lord*, but only the eldest son of an earl is so called. Next below the rank of the nobility are the *baronets*. This dignity was created by James I. in 1611, and descends to the eldest son. There are no privileges annexed to the baronetcy, but the title is considered as an honour, and is often bestowed on men who have distinguished themselves in a civil or military capacity. Below the baronets are *knights* (who also have *Sir* before their names) and esquires, and all others that may be classed among the gentry. The knights are either members of one of the orders of knighthood, or they are knights bachelors. The term *gentry* is sufficiently vague, but may be said to include the richer landed proprietors, and all to whom wealth, office, or talents have secured a certain respect and standing in society. All these may be said to have a claim to be considered as of the rank of *esquires*, which, however, by law is somewhat restricted in its application.

Army and Navy.—The British army is raised on the authority of the sovereign, who is looked upon as its head, and from whom all officers derive their commissions; but the number of troops maintained and the cost of the different branches are regulated annually by a vote of the House of Commons. The maintenance of a standing army in time of peace without the consent of Parliament is prohibited by the Bill of Rights of 1689. From that time onwards to 1879 an act called the Mutiny Act was annually passed for regulating the management of the army and enabling the sovereign to frame the Articles of War to serve as the military code. An Army Annual Act is now passed for the same purpose, and the regulations accompanying it contain the military law of the country. Till recently the whole of the military departments of the army were under the commander-in-chief as supreme head, the civil department being under the financial secretary; at present the secretary of state for war exercises control over all departments of the military service of the country, and the heads of departments, whether military or civil, are responsible to him. (See *ARMY*.) No British citizen is obliged to bear arms except for the defence of his country, but all able-bodied men from eighteen to thirty years of age (with the exception of certain classes) are liable to service in the local militia, the militia being raised when required by ballot. Enlistment among the regulars is either for twelve years' army service (long service), or for seven years' army service and five years' reserve service (short service). The regular army of Britain at present consists of a total of about 160,000 men of all ranks, besides about 74,000 serving in India. There are in addition the four classes of reserve or auxiliary forces, namely, the militia, the army reserves proper, the volunteers, and the yeomanry cavalry. The grand total of all branches at home and abroad amounts to fully 740,000 men. The volunteer force has been in existence only since about 1859. The British army is small when compared with that of some of the Continental states, but the reverse is the case with the navy, which is to be regarded as the main defence of the empire and its extensive commerce. Alfred the Great is commonly regarded as the founder of

the British navy, but as a permanent establishment its origin is rather to be attributed to Henry VIII. Under him were established the admiralty office and the dockyards of Deptford, Woolwich, and Portsmouth, the personnel of the navy at this time numbering about 5000 men. Under Elizabeth the strength of the navy was greatly increased, and it continued to advance till at the Revolution of 1688 the navy was manned by over 40,000 men. About the middle of the following century there were some 70,000 seamen and marines serving in the navy. The end of the eighteenth and the early part of the nineteenth century formed a glorious period in English naval history. In 1814 the navy consisted of some 900 vessels, manned by 146,000 men. After the peace the naval forces were greatly reduced in strength and the number of men employed has never been so great since. The introduction of steam as a propelling power, and of iron and steel as materials of construction, has worked an immense change in the character of the navy, and the 'wooden walls' of England have become a thing of the past. At present, including officers, seamen, boys, and marines, there are about 106,000 of all ranks in the British naval service. Formerly the navy was under the administration of a Lord High Admiral, but since the accession of William III. such an official has rarely been appointed, and a board of admiralty has taken his place. This board now consists of six members, at their head being the 'first lord', who is always a member of the cabinet, and is responsible for the general direction and supervision of all naval business. Under him are four naval lords (men holding a distinguished position in the service) and a civil lord.

Finance, Revenue and Expenditure.—The practice of borrowing money in order to defray a part of the war expenditure began in the reign of William III. At first it was customary to borrow upon the security of some tax, or portion of a tax, set apart as a fund for discharging the principal and the interest of the sum borrowed. This discharge was, however, very rarely effected. The public exigencies still continuing, either the loans were continued, or the taxes were again mortgaged for fresh ones. At length the practice of borrowing for a fixed period, or, as it is termed, upon *terminable* annuities, was almost entirely abandoned, and most loans were made upon *interminable* annuities, or until such time as it might be convenient for government to pay off the principal. Owing partly, perhaps, to the scarcity of disposable capital at the time, but far more to the supposed insecurity of the revolutionary establishment, the interest paid by the government on these loans was comparatively high, and it was, moreover, subject to considerable variation. As the country became richer and the confidence of the public in the stability of government was increased, ministers were able to take measures for reducing the interest. In the reign of George II. the practice of varying the interest was stopped. Instead of varying the interest upon the loan, the rate was generally fixed at three or three and a half per cent, the necessary variation being made in the principal funded. Thus, if government were anxious to borrow in a three-per-cent stock, and could not negotiate a loan for less than four and a half per cent, they effected their object by giving the lender, in return for every £100 advanced, £150 three-per-cent stock—that is, they bound the country to pay him or his assignees £4, 10s. a year in all time to come, or, otherwise, to extinguish the debt by a payment of £150. In consequence of this practice the principal of the debt now amounts to far more than the sum actually advanced by the lenders. Some advantages, however, are derivable from this system. It

renders the management of the debt and its transfer more simple and convenient than it would be had it consisted of a great number of funds bearing different rates of interest. At the death of William III. the public debt, partly by reason of the long wars, amounted to £16,894,702, the public income being £3,895,205. By far the greater part of the next reign also was a time of war, and on the death of Queen Anne the national debt amounted to £54,145,363. The reign of George I. was undisturbed by war, which enabled the government of the time to reduce the debt by £2,053,125, so that at the accession of George II. the whole amount of the debt was £52,092,238. The first twelve years of the reign of the new king were passed in profound peace, but during the latter years of his reign the country was engaged in extensive wars. The total expense of the wars that were carried on between 1739 and 1748 was estimated at £46,418,680, and the cost of the Seven Years' War was £111,271,996. At the conclusion of the Peace of Paris in 1763, after the Seven Years' War, the total debt amounted to £138,865,430. Between the Peace of Paris in 1763 and the outbreak of the American war in 1775 the national debt was again reduced, the amount of the reduction being £10,281,795. Thus, at the outbreak of the American revolution the national debt was £128,583,635. To this that war added £121,267,993, but above £10,000,000 was cancelled between the close and the commencement of the French war, when the debt stood at £239,350,148. During the French war £601,500,343 of new debt was contracted, and on the 1st of February, 1817, when the English and Irish exchequers were consolidated, the total debt was £840,850,491. A considerable reduction was effected between that year and the outbreak of the Crimean war, which again added nearly £33,000,000 to the total, so that in 1857 it amounted to £837,144,597. Since then the debt has been greatly reduced. In 1875 a special act was passed providing for the reduction of the debt, and in 1898 the whole amount of it was £634,435,704. This includes both a funded and an unfunded debt. The latter species is that for which no formal provision has been made, or for which the provision has proved insufficient, or has not been forthcoming at the time when it was required. The form in which it mostly exists is that of exchequer bills, which bear interest at so much per cent per day, and pass from hand to hand like bank-notes. After a certain time they are received in payment of taxes or other moneys due to government, and the interest due on them is allowed in the payment. These bills were first issued in 1696. There are none now issued under £100, and many are for £500, £1000, and larger sums. They are frequently converted into funded debt by granting capital in some of the stocks to the holders. In 1898 the total debt was divided as follows:—Funded, £586,787,624; terminable annuities, estimated capital value at 3 per cent, £40,516,080; unfunded, £23,133,000; total, as above, £634,435,704; other capital liabilities, £3,830,773; grand total, £638,266,482. Against this might be put certain assets, more especially the shares acquired by Britain in the Suez Canal, the market value of which is over £24,000,000. The national debt amounts to about £15, 17s. 6d. per head of the population, and the annual charge on account of it is about 12s. 5d. per head. The British national debt is much below that of France and is considerably exceeded by that of Russia. The charges on account of the debt form the largest item of expenditure, as appears from the following table, which also shows how public revenue and expenditure have increased in recent times

BRITISH ISLES AND SURROUNDING SEAS

Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

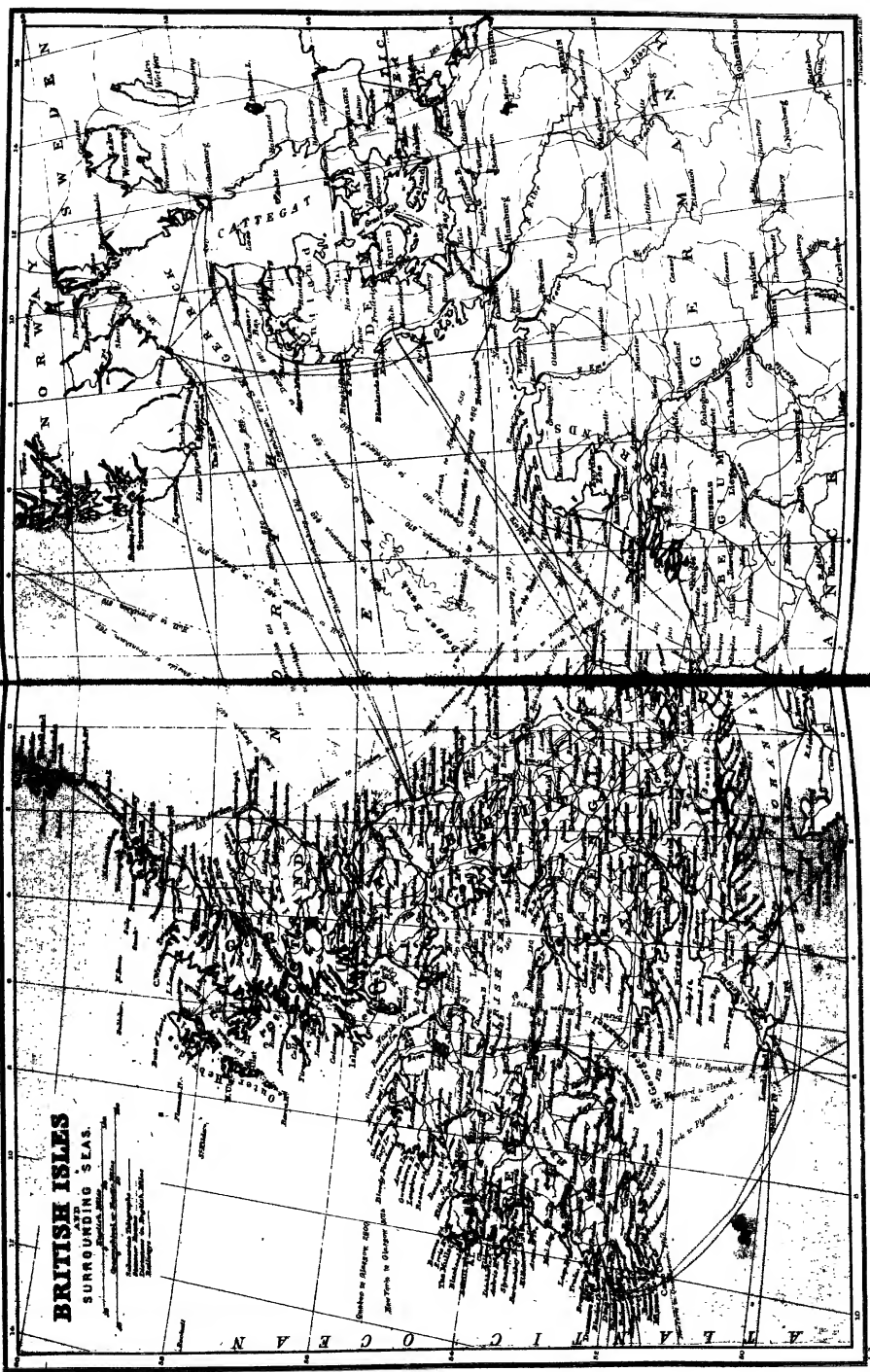
British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres

British Isles
Surrounding Seas
Scale of Miles
Scale of Nautical Miles
Scale of Kilometres



Revenue and Expenditure of the United Kingdom in different years, from 1852-53 down to 1901-1902

Years.	REVENUE.									Total.
	Customs.	Excise.	Stamps Duties, &c.	Land Tax and House Duty	Property and Income Tax	Post Office & Telegraphs	Crownlands	Miscellaneous.		
1852-3	£22,187,045	£15,748,055	£6,907,757	£3,382,351	£5,500,837	£2,373,907	£200,000	£287,910	£57,535,215	
1866-7	22,505,000	20,070,000	9,420,000	3,458,000	5,700,000	4,470,000	330,000	3,073,868	60,434,868	
1886-8	19,337,000	25,480,000	11,540,000	2,890,000	15,100,000	9,890,000	380,000	4,384,221	69,581,801	
1890-1900	23,800,000	32,100,000	22,520,000	2,490,000	18,750,000	16,650,000	450,000	3,110,000	119,840,000	

Years.	EXPENDITURE.								Total.
	Interest and Management of the Nat. Debt.				Civil Charges.				
	Funded.	Unfunded.	Total Funded and Unfunded.	Total Funded and Unfunded.	Civil (Charges, Civil List, &c.)	Army (including general war expenditure &c.)	Naval	Customs and Inland Revenue Post Office and Telegraph Service	
	Permanent.	Terminable Annuities.	Sinking Fund, &c.						
1852-3	£23,708,098	£3,822,856	£2403,852	£27,094,594	£26,004,540	£9,870,900	£4,025,944	£4,057,070	£55,117,866
1866-7	23,415,729	2,378,184	287,838	26,081,773	10,623,010	14,875,540	10,670,101	4,824,938	60,780,590
1886-8	20,068,157	7,854,888	3,288,128	31,241,173	17,181,835	18,140,320	10,723,781	9,717,843	66,960,564
1890-1900	—	—	—	23,000,000	25,204,000	43,817,000	26,000,000	15,041,000	133,732,000

The revenue for 1900-01 was £130,385,000, expenditure £138,592,000, estimate for 1901-02, £132,255,000 and £137,612,000.

DESCRIPTION OF BRITISH ISLES.—Geography.—These islands form a kind of archipelago in the north-west of Europe. The principal islands are Great Britain and Ireland, separated from each other by the Irish Sea, which, near the centre, attains its greatest width of about 180 miles; but between Holyhead in Wales, and Howth Head in Ireland, in the track taken by the English packets, is not wider than 60 miles; and between the Mull of Cantyre in Scotland, and Fair Head in Ireland, narrows to about 12 miles. Great Britain, the larger and by far the more important of the two islands, is situated between lat. 49° 57' 42" and 58° 40' 24" N. It is the largest island in Europe, and the seventh largest in the world; the only islands ranking before it in this respect being Australia, Borneo, Papua, Sumatra, Nippon, and Madagascar. Its nearest approach to the continent of Europe is at its s.e. extremity, where the Strait of Dover, separating it from France, is only 21 miles broad. On both sides of the strait the distance is rapidly increased. The contour of Great Britain is so very irregular, that it seems vain to compare it to any mathematical figure. The N. part of the island in particular, exhibits on its E. coast a succession of large salient angles, while the W. coast is broken and ragged in the extreme; the land ever and anon jutting out into the sea, and the sea making deep inroads into the land, as if the two elements had not yet ascertained their boundaries, and were contending for mastery. The greatest length of Great Britain, measured on a line bearing N. by W. from Rye to Dunnet Head, is 608 miles. The breadth, necessarily modified by the numerous indentations of the coast, varies exceedingly. The longest line which can be drawn across the island, in a slanting direction, is W.S.W. to E.N.E., 387 miles from Land's End to Lowestoffe; but the longest line, measured from the W. to the E. coast on a parallel of latitude, between St. David's Head, in Pembrokeshire, and the Naze, in Essex, is only 280 miles. The breadth is least in the N. parts of the island. Between the Clyde at Dumbarton, and the Forth at Alloa, it is only 53 miles; in the Oikel, which falls into Dornoch Firth, the tide ascends till within 12 miles of the W. coast, and the remarkable chain of lochs between the Moray Firth and Loch Linne leaves so little land intervening between the opposite coasts that the communication left unfinished by nature has been completed by art, and now forms the Caledonian Canal. The area of Great Britain, including the groups of the Orkneys, Shetlands, and Hebrides, is about 33,774 square

miles, of England and Wales alone, 58,186; of Scotland, 29,280 square miles.

Ireland, as already mentioned, lies to the W. of Great Britain, being separated from it by the Irish Sea, and surrounded on all other sides by the Atlantic Ocean. It nowhere extends so far as either the N. or E. extremities of Great Britain, but occupies an intermediate space between lat. 51° 25' and 55° 28' N., its N. extremity being on the same parallel with the central part of Ayrshire, and the town of Alnwick, in Northumberland; and its S. extremity being opposite the Bristol Channel, nearly in the latitude of London. E. and W. it lies between lon. 6° and 11° W. Its shape is much more regular than that of Great Britain, and bears a considerable resemblance to a rhomboid, two sides of which are nearly due N. and S., while the other two take a slanting direction, between W.S.W. and E.N.E. The greatest diagonal of the rhomboid is between Mizzen Head, in Cork, and Fair Head, in Antrim, about 300 miles; the greatest length, measured on a meridian (nearly that of 8° W.), is 230 miles; and the greatest breadth, measured on a parallel (about 54° 25' N.), is 180 miles. The breadth across the centre is nearly 165 miles. Owing to the compactness of its form, Ireland does not exhibit such variation of breadth as we have seen to exist in Great Britain; but the breadth, from Galway Bay to Dublin, is not 110 miles; and the shortest breadth of all, between Ballyshannon and Dundalk, is only 85 miles. One remarkable fact is that, notwithstanding the general compactness of Ireland, its opposite coasts and arms of the sea are so conveniently situated in regard to each other, that there is not a spot on its surface which is not, in some direction or other, within 55 miles of the ocean. The area of Ireland is about 32,531 square miles.

Area of the British Isles

NAMES	Area in sq. in.	Area in acres.
England	50,828	32,527,070
Wales	7,363	4,712,232
Isle of Man	227	145,325
Channel Islands	75	45,332
Scotland	29,820	19,064,650
Ireland	32,531	20,819,839
Total	120,839	77,380,487

Physical Features.—We are so much accustomed to think and speak of the two kingdoms of England and Scotland, that we are apt to imagine, not merely a political, but also some great physical distinction

between them. In fact, however, there is no such physical distinction. Their frontiers, in part at least, merge insensibly into each other, and the whole must be viewed as one island, which, in regard even to physical features, is among the most interesting islands in the world. Though of comparatively limited extent, all varieties of scenery are exhibited in rich profusion on its surface, and all forms of geological structure lie within its bosom. The *s.* part of Great Britain is, for the most part, rugged, mountainous, and barren. To the *n.* of a line drawn from the Firth of Clyde on the *w.*, to Stonehaven on the *e.* coast, the whole country is composed of primary rocks. This area, usually spoken of as the Highlands, is divided into a north-western and a south-eastern portion by the Great Glen, in which lies the waterway of the Caledonian Canal. Gneiss and mica slate, with numerous outbursts of granite, form lofty mountain masses (they cannot be called chains), whose lower slopes are usually covered with beds of conglomerate and old red sandstone. The series of groups and masses known as the Grampians contain the loftiest mountains in the island, their culminating points, Bennevis and Ben Macduil, being respectively 4408 and 4296 feet. These mountains, from the nature of the materials of which they are composed, frequently assume the form of peaks and frowning precipices, which, as they descend, instead of terminating at the general level of the base, are continued downwards, and become the romantic barriers of deep extensive lakes, presenting scenes in which sublimity and beauty strangely intermingle. South of and separated by a valley from the Grampians are the Ochils, which are much less elevated than the Grampians, and exhibit scenery of a much tamer description. They consist chiefly of porphyry and amygdaloid, in which numerous nodules of agate and carnelian are found. Instead of towering up in sterile peaks, they are generally rounded, and clothed to their summits with verdant or heathy pastures. On their *s.* slopes a new geological formation appears. The carboniferous system, at first with its strata almost turned on edge, and thrown into confusion by contact with masses and veins of trap, soon becomes fully developed, and stretches, with occasional interruptions, from the *e.* to the *w.* coast, over the basins both of the Forth and Clyde. The mineral treasures of this district—the Central Lowlands—make it one of the most important in Great Britain. To the south of this lies the region of the Southern Uplands, to which belong the Lammermoor Hills, the Moorfoot Hills, and the Lowthers or Lead Hills, so called from the veins of lead by which its strata are intersected. In earlier times their alluvial covering embedded a more precious metal, and the washing of the soil is said to have yielded gold. Still further to the *s.* several large masses of granite occur. Towards the *s.e.* the most conspicuous feature is formed by the Cheviot Hills, a porphyritic range, which once formed part of the boundary between two independent kingdoms, and which sends its ramifications into both. Those which pass into England may be regarded as the commencing links of a long chain of mountains and hills, which extends, with scarcely a single interruption, along the *w.* side of that division of the island, forming its most important water-shed, and throwing out numerous branches, particularly those which penetrate into Cumberland and Wales, and give a somewhat modified but scarcely less attractive repetition of the magnificent scenery to which reference has been made. In the *n.* part of this chain, or that part to which the name of Cumbrian range is sometimes given, the most striking feature is formed by the series of romantic lakes so

well known to tourists from all countries. Here granite and a species of basalt are occasionally seen, but the prevailing rocks are slates and sandstones, belonging to the silurian series. In other parts of this range trap-porphyry occurs. It forms the very summit of Seawfell, and is seen, in still more interesting circumstances, at Sotall, in Borrowdale, where, at its contact with a bed of red unctuous clay and ironstone, occurs the celebrated vein of graphite which long furnished the finest black-lead pencils in the world. Another largely developed rock of the same range is the mountain limestone, which, if anywhere, here truly deserves the name; inasmuch as it forms lofty mountain-masses—Ingleborough, Wharfedale, Penninant, and Cross Fell being almost entirely composed of it. This limestone is often intersected by rich veins of lead. In the lengthened chain already referred to, and to the *s.* and *w.* of the Cumbrian, is the Cambrian range, spread over the greater part of Wales, and containing, among others, the highest mountain of S. Britain—Snowdon, 3571 feet. The rocks, like those of the Cumbrian range, lie low in the geological series, and consist almost entirely of slate, and different varieties of trap and porphyry. The great exception is towards the *s.* limits of the range, where the silurian rocks are overlaid by an extensive tract of old red sandstone, overlaid in its turn by the mountain limestone, which, like a girdle, encircles the most extensive, if not the most valuable, of the British coal-fields.

To the *s.* of the Cambrian is the Devonian range, stretching from the Bristol to the British Channel, and though lofty enough, when viewed from the level of the sea, to present a coast of remarkable boldness, too low to deserve the name of mountains. Here granite is extensively developed, and, often possessing the property of decomposing rapidly, furnishes the white clay called kaolin, of which the finest porcelain is made. The granite underlies the old red sandstone, or rather a slate which is considered to be its equivalent; and prevails to such an extent, particularly in Devonshire, as to have given its name to a geological formation, hence termed the Devonian series or system. Here the mineral treasures are tin and copper, veins of which, generally at a high angle, and in a direction from *e.* to *w.*, intersect the slate and granite, and vary in width from a few inches to several feet. The different ranges now described as occupying the *w.* side of England, and stretching from its *n.* to its *s.* extremity, are composed entirely of primary rocks, or at least of rocks which, with the exception of the great Welsh coal-field, and another of limited dimensions on the *e.* coast of Cumberland, never stand higher in the geological series than the lowest strata of the carboniferous system. On proceeding *e.* the case is reversed, and the oldest strata which occur are identical with those which were in the previous case the most recent. Here, accordingly, secondary formations prevail, beginning with the mountain limestone or coarse quartzose sandstone, known by the name of millstone grit, on which our coal-fields are usually based, and ascending by regular gradations up to the more recent tertiary deposits. The coal-fields, notwithstanding their really incalculable economical value, occupy a comparatively limited extent of surface—an extent certainly not under-estimated at one-twentieth of the whole. A line drawn from Lyme-Regis to Bath, thence to Gloucester, Warwick, Leicester, Nottingham, and Tadcaster, and from Tadcaster to Stockton-on-Tees, has on its *s.* side nearly two-thirds of the whole surface of England. In the whole of this space no coal is worked. If the series of strata are regular, there can be no doubt that coal exists; but probably at a depth far beyond

the reach of any known means of excavation. The chalks, which occupy the uppermost place in the secondary formation, though in Scotland confined to a few patches, constitute a marked feature in the geology of England, where they not only compose the prevailing strata of extensive undulating tracts, but form in many places, both on the *s.* and *s. e.* coasts, bold and giddy cliffs, from whose white colour the ancient name of *Albion* is said to be derived. The tertiary formation, which includes the rocks above the chalk, is of comparatively limited extent, and is succeeded by immense beds of diluvial (or glacial) gravels, sands, and clays, in which are found remains of the larger existing quadrupeds, several of them, like the elephant and rhinoceros, belonging to genera which now exist only in much hotter climates. Above these diluvial beds lie alluvium and other superficial deposits, the constituents of which, mainly depending on the rocks from which they have been disintegrated, determine the natural properties of the soil, sometimes giving it an almost inexhaustible fertility, and sometimes dooming it to comparative barrenness.

Turning from Great Britain to Ireland, one of the most marked features which meet our view is the dreary expanse of bog which stretches over its interior. The surface, as might hence be inferred, is much flatter than that of Great Britain. It is not, however, by any means destitute of mountains. Of these no fewer than twenty-four exceed 2000 feet, and four exceed 3000 feet. Carn Tual, the culminating point of the island, is 3840 feet. It belongs to a group called the Mountains of Kerry, which, in connection with the Lakes of Killarney, placed in the very heart of them, furnish scenes which, for picturesque beauty, few countries can surpass. The great mountain groups consist of primary and transition rocks, and are generally situated near the coasts, which accordingly become of the boldest description. Inland behind these lofty barriers lies a vast undulating plain, occasionally penetrated and broken up by masses of primary rocks, but occupied almost throughout its whole extent by secondary formations. Of these by far the most largely developed is mountain limestone, much of it so fine-grained and compact as to furnish quarries of marble, both black and variegated, but seldom containing the rich veins of lead which usually accompany the same formation in England. The limestone is succeeded in regular gradation by the upper strata of the carboniferous system, and coal has been found to a greater or less extent in no fewer than seventeen Irish counties. In general, however, its quality is inferior. Some of it is in the form of anthracite, of which seams of remarkable purity, almost entirely composed of carbon, occur in the vicinity of Kilkenny; but the greater part of the coal raised is more dress or culm, scarcely fit to be employed for any more important purpose than burning limestone. Still higher in the series above the coal, the upper strata of the secondary formation are considerably developed in the *n.*, where they are capped by numerous masses of volcanic origin. The most magnificent specimen of these is the range of basaltic columns which forms the celebrated Giant's Causeway.

Rivers and Ports.—The mountain-chains which constitute the principal water-sheds of Great Britain, are generally at no great distance from the *w.* coast, and hence the rivers which descend from them in that direction have a short course, and are comparatively unimportant. The two great exceptions to this rule are the Clyde and the Severn. Both of them have their mouths on the *w.* coast, but they owe both their volume and the length of their course to a series of longitudinal valleys, which, instead of opening directly to the coast, take an opposite or

parallel direction, and thus, rather skirting the watershed than flowing from it, obtain much larger supplies of water than a direct course could have given them. The former of these rivers, though of vast commercial importance, is indebted for it far less to its natural channel than to the immense sums judiciously expended through a long series of years in improving and almost creating its navigation. Considered merely as a river, it is comparatively insignificant, the whole length of its course to Dumbarton, where the first properly commences, being not more, including windings, than 73 miles. The Severn is a much longer stream, and carries along with it a much mightier flood, which, commencing in the mountains of North Wales, proceeds *s.* through long valleys opened into by others which add their tributary streams, till the immense accumulated volume is poured into the Bristol Channel. These two are the only rivers of any considerable volume of which the *w.* coast can boast, though it also possesses the Mersey, in commercial importance the second river of the empire; but the *s.* coast, proceeding from *n.* to *s.* has the Spey, Don, Dee, Tay, Forth, Tweed, Tyne, Ussie, Trent, and Thames. This list contains the Tay, in volume the first river of Great Britain, and the Thames, not much less in volume, and in navigable importance the greatest river of the world. It is remarkable that no river of importance empties itself either on the *n.* or *s.* coast. Owing to the great central flat of Ireland, its rivers usually flow on in a gently winding course, and being little interrupted by natural obstructions they are well fitted for navigation. Those of importance are not very numerous; but one of them, the Shannon, is understood to be the longest river of the British Isles. Within 7 miles of its source it enters Lough Allen, which is itself navigable, and after passing out of the lough pursues a *s. w.* course of 214 miles, the whole of which is available for transport by smaller vessels, while from its mouth up to Limerick, a distance of 70 miles, it floats vessels of 1000 tons. In numerous features this noble river bears a remarkable resemblance to the Severn. We have seen that in Great Britain the *s.* coast regions possess the greater part of the rivers. In Ireland the rule is reversed. The Liffey, more important from having the capital on its banks than from its own magnitude, is the only river on that coast deserving of notice. While both Great Britain and Ireland are thus provided with numerous streams, which ramify over their various districts, and in many cases are either themselves navigable or furnish the means of continued navigation by acting as the feeders of canals, the coasts are scooped out into various deep and sheltered bays, in some of which whole fleets of the largest ships can float and ride in safety. It is true, however, that the number of ocean harbours, properly so called, is not great, and that the *s.* coast of Britain in particular is so scantily provided as to make the construction of a great harbour of refuge at some central point a work of primary necessity, which must sooner or later be performed. The best of the great natural harbours are situated on the *s.* coast.

Climate.—The British Isles being nearly in the centre of the temperate zone, have, in common with all countries so situated, four different seasons, which merge almost insensibly into each other, but exhibit a wide range of temperature between their opposite extremes. The central latitude of the United Kingdom is nearly 55° *n.*, and the isothermal line which passes through it indicates a mean annual temperature of 50°. If we follow the course of the isothermal line eastward, we find that on approaching the coast of Holland it is deflected southward, and this deflection continues to increase in the same direction

till the mean annual temperature of 50° corresponds with lat. 45° on the east side of the Sea of Azof. From this point we may follow it across the Caspian, and on through Mongolia and Manchuria to the Sea of Japan. If we follow it across the Atlantic we find that it strikes America in about lat. 41°. The fact is thus established that in respect of mean temperature the British Isles have the advantage of all the countries in the same latitude both to the east and the west of them. Another superiority in the British climate is in regard to range of temperature. A winter of 10° and a summer of 90° give the same mean temperature as a winter of 40° and a summer of 80°, but how unlike the climates! The range of temperature between the coldest and warmest months is at Paris about 80°, at London only about 26°. At Edinburgh the range is about 25°, while at St. Petersburg it is no less than 55°. The chief agents in moderating the climate of the British Isles are the Atlantic Ocean with its warm surface waters drifting from the south-west, and the warm winds which prevail during a large part of the year from the same quarter. While they blow, frost is of rare occurrence and never of long duration in the British Isles. When the wind blows from the N., after it has passed over immense fields of ice, or from the E., where, from the limited expanse of the German Ocean, its temperature continues nearly as low as that which it had acquired in passing over the Continent, the atmosphere is rapidly cooled down, and frosts are occasionally severe. These considerations explain the only disadvantages under which the British climate labours. South-west winds charged with vapour, bring deluges of rain; and N. and E. winds are accompanied with considerable, and too often sudden, accessions of cold. East winds, in particular, prevail in spring, and not only check vegetation, but tend to produce, or, at all events, greatly aggravate, pulmonary complaints. Still, the advantages far more than counterbalance the disadvantages; and the cloudless skies of South Europe, accompanied as they are with scorching heats which wither up the fields, and often make what should be the finest the least tolerable season of the year, poorly compensate for the magnificent foliage and rich verdure which, at the same season, give a peculiar charm to the British Isles.

Communications.—The prosperity of the country has been greatly furthered by all parts of the United Kingdom having been brought into easy communication with each other by means of roads, rivers, canals, and especially railways. On all of these sums of almost fabulous amount have been expended, and in the case of railways especially, nothing is more remarkable than the number of these which now traverse the United Kingdom in all directions; and which, particularly in the greater part of England and in Central Scotland, cover the whole face of the country, and intersect one another at innumerable points. From 1825 to 1850, a period of a quarter of a century from the opening of the first railway, 6621 miles of railway were constructed in the United Kingdom, being an average of 265 miles in each year. Between 1850 and 1880, 8812 additional miles were constructed, giving an average of 381 miles in each year; and between the latter year and the end of 1881, 7747 miles were constructed, being at the rate of 369 miles every year. The total mileage then amounted to 18,175, which by 1891 had increased to 20,191 miles. In Dec. 1898 there were in all 21,659 miles of railway open in the United Kingdom, of which 15,007 miles belonged to England and Wales, 3476 to Scotland, and 8176 miles to Ireland. Of the total paid-up capital of nearly £1,185,000,000, England and Wales absorbed £936,135,000; Scot-

land, £158,983,000; Ireland, £39,350,000. The net receipts of the railways of the three kingdoms were £33,603,000, £5,160,450, and £1,528,480 respectively; total, £40,292,000. When compared with other European countries, the United Kingdom is seen to stand fourth in point of the actual length of railways open, the first being Germany, the second and third France and Russia. When the number of miles of railway in proportion to the area of the United Kingdom is compared with those of other countries, it occupies the position of second in order, for whereas the United Kingdom has only 17·4 miles of railway to every 100 square miles of surface, Belgium has 81·4 miles of railway to 100 miles of surface. Belgium's total length of railways, however, is only 8590 miles. The total length of tramways in the United Kingdom is fully 1000 miles. The canals have a total length of over 3800 miles.

Among the means of communication, in a somewhat different sense of the word, may also be mentioned the postal, including the telegraph, system of the United Kingdom. In the year 1898, 2,012,300,000 letters were delivered in the United Kingdom, giving an average of about 50 per head of population. Of post-cards 360,400,000, and of book-packets, circulars, and newspapers 878,200,000 were delivered. In England and Wales the number of letters delivered was at the rate of 55 for each person, in Scotland 42 for each person, in Ireland 27 for each person. The gross revenue (including that of the telegraphic system) in 1898 was £15,237,046, and the gross expenditure £10,813,000, leaving a net revenue of £4,419,046.

Since the transfer of the telegraphs to the state in 1870, the telegraph system has been greatly increased by additional lines and offices, and the business has increased in a still greater proportion. In 1898 the total length of telegraph wires in the United Kingdom was over 280,000 miles with 41,516 miles of line. The number of messages sent in the year was over 83,000,000. Of these some 70,000,000 were forwarded from offices in England and Wales, and nearly 8,500,000 from offices in Scotland. This department has also telephone exchanges in various towns, besides 60 miles of pneumatic tubing in London.

Agriculture.—Of all branches of industry, this unquestionably demands precedence, more especially because by its very nature it is not merely conducive to the well-being, but essential to the very existence of society. In Great Britain it has been carried to great perfection, and, according to Professor Thorold Rogers, 'it may be confidently averred that owing to improvement in stock and seeds, agriculture in the United Kingdom is at a higher level than in any other country'. Thorough and systematic draining, the extensive use of artificial manures, and the employment of the newest implements are among the chief features of modern British agriculture. A peculiar feature of English as distinguished from Scotch husbandry is the large amount of arable land in England forming permanent hay-fields. These are kept fertile by heavy doses of farmyard manure, and yield grass of admirable feeding qualities. Much of the land thus employed is naturally of poor quality, but by long and careful management has become covered with a close sward of the richest green, furnishing admirable food for stock. The great extent of permanent pasture is also a feature of Irish agriculture. In the rearing and fattening of stock there is no country in the world that can be compared to several districts of Great Britain. Among breeds of horses, the race-horse, the 'shire horse', the Suffolk punch, and the Clydesdale may be mentioned; among cattle, the shorthorn; the Hereford, the Aberdeen-Angus, and the Ayrshire;

among sheep, the South Downs, Leicesters, Cheviots, and black-faces. The principal cereal crops grown in England are wheat, barley, and oats, each now occupying much about the same area; the principal green crops are turnips, potatoes, mangolds, vetches, &c. In Ireland and Scotland oats are by far the principal grain crop; by far the chief green crop being in Ireland potatoes, in Scotland turnips. Hops are grown to a large extent in Kent, and less extensively in some other parts of southern England. Of the whole area of Great Britain less than 60 per cent is under the plough or in pasture, but in England the proportion is about 75 per cent, and in Wales above 60 per cent, while in Scotland it is under 25 per cent (so much of Scotland being barren). In Ireland the proportion is about 75 per cent. The agriculture of Ireland, though the soil itself offers every advantage to the farmer, is in a very different condition from that of Great Britain, being in a very backward state on the whole, mainly owing to the subdivision of holdings and to overcropping, combined with the ignorance and unskillfulness of the people.

The following table gives a general idea of the distribution of crops in the United Kingdom in 1898:—

	England and Wales.	Scotland.	Ireland.
	Acres.	Acres.	Acres.
Under corn crops.....	6,128,911	1,271,424	1,890,841
" green crops.....	2,613,978	619,592	1,105,929
Grasses under rotation, clover, &c.....	8,308,966	1,607,964	1,252,889
In permanent pasture.....	16,178,178	1,881,214	11,890,050
Fallow land.....	844,815	7,279	10,887

The total in crops, bare fallow, or grass thus amounted altogether to nearly 48,000,000 acres. The mountain and heath land furnishing pasture and not included in these figures is, for England, 2,249,164 acres; Wales, 1,187,404 acres; Scotland, 9,420,370 acres. The total number of agricultural holdings in Great Britain above one acre is about 520,000, in Ireland it is about 514,000.

The following table shows the number of horses used in or connected with agriculture, and of cattle, sheep, and pigs in the United Kingdom in 1898:—

	England and Wales.	Scotland.	Ireland.
Horses.....	1,815,579	201,581	513,788
Cattle.....	5,876,039	1,240,284	4,480,242
Sheep.....	19,155,246	7,687,945	4,287,274
Pigs.....	2,317,479	134,116	1,253,582

In British farming a period of severe depression has prevailed since about 1875. For many years previous to this agriculture had been in the most flourishing condition, prices being high and large profits being made. Since then the reverse of this has been the case. Prices of almost all kinds of farm produce have fallen enormously, large numbers of farmers have been ruined, and others even at greatly reduced rents can scarcely make headway; while a good deal of land has gone out of cultivation. The main cause of this is the severe competition of foreign countries and British colonies, combined with bad seasons. In 1874 the average prices of wheat, barley, and oats were respectively 55s. 9d., 44s. 11d., and 28s. 10d. The average price of wheat per quarter in 1894 was only 22s. 10d.—the lowest recorded for a hundred and twenty-four years. The average price of barley was 24s. 6d., the lowest since 1850, when it was 29s. 5d., while the price of oats was 17s. 1d. Recently there has been some improvement in prices.

VOL. II.

of grain. The prices of beef, mutton, dairy produce, and wool have also undergone a great reduction during the period referred to. The result of the changed conditions has been that, while in 1871-75 the land under the plough in England and Wales annually averaged 13,896,000 acres, and that under pasture 10,217,000 acres, the figures for 1898 were as given above; the increase in pasture showing that farmers, on the whole, find it may better to feed stock than to raise grain. See AGRICULTURE.

Minerals.—Such is the mineral wealth of the British Isles, that, with the exception of quicksilver and gold, which, though found both in Britain and Ireland, are so limited in quantity as hardly to repay the labour of searching for them, it is scarcely possible to mention a metal or mineral product of economical value which is not worked, to a greater or less extent. Among these, the first place is unquestionably due to

Coal.—Coal claims precedence, not merely because the annual output of it, in regard both to quantity and aggregate value, exceeds that of any other mineral product, but because without it the other natural resources of the country, and the industry of its inhabitants, must have for ever remained in a great measure undeveloped. The coal-fields are not confined to one particular district, but occupy a series of basins sometimes touching, but more frequently at a considerable distance from, each other, and extending in an irregular curve from the S. slopes of the Ochil Hills to the Bristol Channel. Beginning with the farthest northern limit, we find a coal-field occupying a not inconsiderable part of Fifeshire and almost the whole of Clackmannanshire. The coal of this field is of several kinds; but the most important seams are splint, part of it of a free, open, burning quality, greatly in demand for steam navigation from its not corroding the furnaces and boilers, and part of it admirably adapted for the blast-furnace. Part of this field, immediately to the west of Dunfermline, contains a coal which, in its richness and quality of caking, bears a resemblance to that of Newcastle, and has been worked, as ancient records prove, for at least five centuries. On the opposite side of the Forth, and almost in visible communication with the field already described, another field extends over part of Eastern Stirlingshire and a considerable portion of the Lothians. It furnishes the greater part of the fine fuel which is used in the metropolis of Scotland, and contains excellent seams of parrot coal. To the south and south-west are the coal basins of Lanark, Renfrew, and Ayrshire; the first much the largest, and famous throughout the world for the immense industrial establishments which it mainly has called into existence and made prosperous. The second may be regarded as a continuation of the first, and as connected with its industries. The last is the most recently developed of the three. In connection with the coal-fields, especially with those of the Lothians, should be mentioned the oil-shales, on which an entirely new industry, that of extracting paraffin-oil and other products, has been founded. On passing the border the Newcastle coal-field lies before us, extending over a great part of the counties of Northumberland and Durham, and centring near Newcastle, which gives it its name. The proximity of this field to the sea, and the excellence of the coal, unrivalled for domestic use, early made it the great theatre of mining operations. The association of coals with Newcastle has long been proverbial. It is Durham, however, that now yields most of the coals, a larger quantity being raised here than in any other English county. This field furnishes a large proportion of the coal conveyed by sea both to home and foreign ports. On the opposite coast, nearly in

the same latitude, is a small coal-field, the workings of which, at Whitehaven and Workington, have been carried to a great distance beneath the sea. The next coal-field to the s. is, in many respects, the most important of all. It includes a large central space, not entirely occupied by coal, but interrupted, longitudinally, by a broad belt which consists of the lower strata of the carboniferous system, and thus forming a kind of twin fields, one of which extends from Leeds to Nottingham, while the other has its greatest length from s.w. to n.e., and borders both on Manchester and Liverpool. This great coal area can boast, not only of being the seat of what has been termed the world's great workshop, but of furnishing the most essential elements both of its existence and prosperity. The only other coal-field of a magnitude similar to those already mentioned is that of South Wales, which, though it long lay almost unknown or unheeded, has in comparatively recent times become the centre of great and varied industries, while Cardiff, as its maritime outlet, has risen to be a large town and the greatest coal-exporting resort in the world. The field is of an irregularly oval shape, and, passing from Monmouth on the n., continues w. without interruption through Glamorgan to Carmarthen Bay, across which another field, or continuation of that already mentioned, stretches irregularly to St. Bride's Bay. There are several other minor fields, all of them, with exception of that of North Wales, situated near the coasts of England, and thus, from position as much as from extent, possessed of great value. Their names are: the North Staffordshire, the Shropshire, the South Gloucester and Somersetshire, the Warwickshire, and the South Staffordshire. The most important on the list are the North Staffordshire, the principal seat of the potteries, and the last two, Warwickshire and South Staffordshire. In South Staffordshire occurs the enormous seam known as the Ten-yard Coal of Dudley. It properly consists of several seams separated by very thin beds of clay. The output of coal in Great Britain, which in 1855 was only 61,453,079 tons, has been on the increase ever since. About a sixth part of the total produce is now usually exported to foreign countries or British possessions, and about the same consumed in the manufacture of iron. The following table shows the recent progress of the coal trade:—

Tons of Coals Raised, Exported, and Retained for Home Consumption in Various Years.

	Raised	Exported	Retained
1879....	183,808,000	16,442,296	117,305,704
1880....	176,910,724	28,956,445	147,954,279
1884....	184,377,525	81,766,368	156,521,157
1889....	220,064,781	43,111,404	176,953,377

The value in 1889 was £83,481,137; the output in 1900 was 225,170,000 tons, the value £121,649,000.

Iron.—The iron ores smelted in Great Britain are principally carbonates, which are invariably found to a greater or less extent and in a great variety of forms, with very different qualities, in the coal measures. Yet more than two-fifths of the ores now smelted are oxides (principally hematite and hydrated oxide). The most important iron districts yielding carbonates are those of Yorkshire, especially the rich Cleveland district in the North Riding, Shropshire, Staffordshire, South Wales, and the coal measures of Scotland. Hematite (red) is obtained chiefly in Lancashire and Cumberland; brown hematite to a smaller extent in South Wales and Cornwall. Hydrated oxide or brown iron ore is found principally in the counties of Northampton and Lincoln. Hematite is by far the richest of these ores, and hydrated oxide comes next in this respect. The following table shows the quantity and value of the pig-iron produced in the United Kingdom in some recent years:—

Years.	Quantities.	Value.
1879.....	3,995,837	£14,788,848
1880.....	8,332,534	30,380,918
1884.....	7,427,842	17,023,587
1889.....	8,609,719	25,615,754

Other minerals.—Lead, tin, and zinc are the metals produced next in importance to iron. The value of the lead produced in the United Kingdom in 1889 was estimated at £333,021; of the tin, £345,812; of the zinc, £179,482. Small quantities of copper and silver are obtained. An important article is salt, chiefly from rock-salt and brine pits, the quantity produced in 1897 being valued at £620,898. Salt is most extensively worked in Cheshire, and the supply is so great as to be inexhaustible. Quarries exist in almost every part of the British Isles. They furnish admirable building-stone of various kinds, including in some localities granite, which is employed for ornamental and other purposes. Limestone is plentiful, as are also clays of various kinds; and from Wales and other parts are obtained quantities of the finest roofing-slates. The total estimated value of coal and metals raised in 1900 was over £160,600,000.

Fisheries.—The fisheries of the United Kingdom have long been of importance, and latterly their importance has considerably increased, larger vessels being now employed, and many of them propelled by steam. One great obstacle to the general consumption of fresh fish, namely, the difficulty of transport, is now much diminished by the facilities offered by the railways; and in some important inland towns, where fresh fish were previously known only as an expensive luxury, they can now be had at a price which places them within the general reach. The principal fresh-water fisheries are those of salmon, carried on chiefly in the rivers and estuaries of Scotland and Ireland. The chief sea-fisheries are those of herrings, haddocks, cod, and the various kinds of flat-fish—plaice, soles, turbot, &c. The herring fishery is carried on on almost all the coasts and islands of Scotland, but especially on the east coast, the great centres of resort for curing being the towns of Wick, Peterhead, Fraserburgh, Aberdeen, &c. Many herrings are also caught on the east coast of England. The other fishes mentioned are caught all round the coasts, and especially in certain localities in the North Sea, one of the most famous being in the neighbourhood of the Dogger Bank. Among minor fisheries may be mentioned those of mackerel, pilchards, oysters, and lobsters. The annual value of sea-fish caught is about £3,000,000.

Manufactures, Commerce, &c.—History.—The manufactures and commerce of England began to establish themselves at a period long before those of Scotland came into existence. Tin is said to have been the first article of British commerce. The Phœnicians are generally said to have visited the coasts of England for the purpose of procuring tin. The Romans, while they occupied England, introduced various industries to supply articles for home consumption, and constructed great highways. In their time grain is said to have had some importance as an export. Industry and commerce made some progress among the Anglo-Saxons, but received a check from the invasions of the Danes and Normans. But under William the Conqueror a body of Flemish weavers settled in the island, and from this period it may be said that the staple of England was coarse woollens. The tyrannic John assumed the sole power of commerce in his kingdom, and erected corporations and monopolies wherever he thought proper, or whenever he was tempted by the offer of a sufficient bribe. Under such restraints, and while subjected to the caprice and oppression of one man, trade must have been greatly hampered. No adventure was

made, unless with the prospect of exorbitant profits. The interest of money, therefore, became extremely high; and under Henry III. we find it often to have been no less than 50 per cent. It was, however, during the reign of this latter prince, that regulations were made respecting broad-cloths, russets, &c., and fine linsens were woven in England at this early period.

During the vigorous, and in some measure prosperous reign of Edward I., commerce met with some encouragement; but the true principles of trade were ill understood. In 1296 the Society of Merchant-adventurers was instituted for the purpose of improving the woollen manufactures, and encouraging the exportation of that national staple. Edward granted more protection to foreign merchants than they had formerly enjoyed; and though he still left them subject to the iniquitous law of answering for the debts and crimes of any of their countrymen, he allowed them the privilege of trial by jury, and fixed the duties on importation and exportation. The office of *alnager* is likewise mentioned as existing in this reign.

Manufactures and commerce, during the weak reign of Edward II., were almost entirely unprotected. The disorders of this reign rendered property insecure, and consequently discouraged honest adventure and the exertion of useful ingenuity. That English manufactures were in a very rude state at this time appears from the fact that the wealthy men of the age often bequeathed their silk or velvet garments formally by will, as constituting a valuable part of their property. Flanders was then the only country in Europe where commerce was either understood or practised. The first great historical encouragement given to the woollen manufactures of this country was in the reign of Edward III. He protected foreign weavers, and prohibited his subjects from wearing any cloth not of English manufacture. In 1331 John Kemp, with seventy Walloon families, was invited into England, and Kendal became the metropolis of the woollen manufacture. Wool was exported to a considerable amount; but by a very absurd law the exportation of woollen cloth, as well as of wrought iron, was prohibited. The exports at this period consisted entirely of raw materials, such as wool, hides, butter, tin, lead; manufactures were almost unknown. The imports were chiefly linen, fine cloth, and wine. The value of the total exports in 1354 was £294,184, 17s. 2d. This sum was in money of that period, and reduced to the present denomination and value would be very large. It is remarkable that the value of the imported cloth, per piece, was at this time three times as great as that of the exported; it may be inferred that the quality was also greatly superior.

The troubles of the reign of Richard II.—the care which Henry IV. was obliged continually to exert for the preservation of that authority to which his title was so lame,—the incessant military expeditions of Henry V.,—the misfortunes of Henry VI.,—and all the miseries brought upon the nation by the bloody contest between the houses of Lancaster and York,—effectually opposed the progress of arts, manufactures, and commerce. Nevertheless, some foreign merchants residing amongst us amassed great wealth. The commercial regulations of Henry VII., however well meant, were in reality destructive of national industry. Laws prohibiting the exportation of certain articles were multiplied; the number of corporations and monopolies was increased, and other restraints imposed, which tended powerfully to obstruct the national prosperity. Fine cloths, however, seem to have been much improved about this time; and in 1468 the Company of Stanley and to

the crown £68,000 sterling for the customs of staple wares.

The foreign commerce of England under Henry VIII. was confined to Flanders; and of such importance was this commerce already found, that when war broke out between the English and Flemings, it was agreed that the commercial relations of the two countries should not be interrupted. Foreign artists were now numerous in England; their superior skill and industry excited the envy of the natives, and caused the enactment of many severe and preposterous laws against aliens. The Flemings, in particular, were so numerous that 15,000 of them were expelled at one time from the city of London. The true method of encouraging commerce still remained ill understood. Monopolies and corporations were multiplied; the prices of labour and provisions were fixed by an absolute authority; sumptuary laws were enacted; and the legal interest of money was in this reign fixed at 10 per cent. The interest really required was probably much higher; but the lending of money on interest was generally esteemed unlawful, and the law by which it was permitted was repealed during the following reign. In 1567 glass was manufactured in England.

The disorders attending the minority of Edward VI., and the religious disturbances under Mary, were opposed to the commercial progress of the nation. Under Mary, however, we find a law which indicates greater liberality of views than might have been expected at this period. A law had been formerly enacted prohibiting anyone from making cloth who had not served an apprenticeship of seven years. This law, during Mary's reign, was repealed; but, little to the honour of Elizabeth's penetration in affairs of trade, it was revived by Mary's successor.

Elizabeth was doubtless desirous of advancing the commerce of England, yet she certainly pursued measures of a directly opposite tendency. In particular, she exerted her prerogative in the creation and encouragement of monopolies of every description. Besides innumerable others of inferior importance, she established the East India Company in 1600—a society politico-commercial of such giant dimensions as no country ever could parallel. She confined the trade with Turkey to a company known by the name of the Turkey Company. She likewise procured from John Basilides, a Russian prince, a law forbidding all nations, except the English, to trade with his subjects; but this law was abrogated by his wiser successor. Several attempts, during her reign, were made to discover a north-west passage to the East Indies, and several colonies were founded in North America; but in these attempts and undertakings Elizabeth's subjects enjoyed her permission only, not her encouragement or aid. English manufactures were still very imperfect and were surpassed by those of every other nation. Much of our exports consisted in white undressed cloths; and the profits upon dyeing and finishing, amounting to £1,000,000 a year, were lost to us, these operations being generally performed on the Continent. The legal interest of money was fixed at 10 per cent. during this reign, while the legal interest in France was 6½ per cent.—a proof that commerce in France, at that time, flourished much more than in England.

The pacific reign of James I. imparted a degree of prosperity to the commerce of England which it had not formerly known. Her manufactures, however, were still inconsiderable, consisting, for the most part, of articles and utensils for domestic consumption. Wool continued to be a great material of national trade; and, during this reign, the exportation of raw wool was forbidden. The greater part of the cloth, however, was still exported without being dressed

and dyed—operations which it underwent in Holland. The attempts for the discovery of the north-west passage led to the discovery of Greenland; and the whale-fishing was soon thereafter carried on with some success. The trade to Spain—originally a monopoly—was now laid open, and soon augmented in an unexampled degree; but the nation, incapable of profiting by such a plain argument, proceeded no further than to compel the monopolizing companies to extend their stock, and to render the admission of new adventurers less difficult than it had formerly been. The chief glory of James's reign in a commercial point of view, however, was the establishment of the American colonies—establishments which have founded an empire of Englishmen in the New World, and which, perhaps, more than any other cause have augmented the trade of Britain.

In 1618, the exports of England amounted to	£2,487,435
the imports	2,141,151
In 1821, the exports were	2,820,436
the imports	2,610,815

The number of seamen engaged in the commerce of England during this reign is said to have been 10,000. In 1641 the customs of England are said to have amounted to £500,000.

The disorders which preceded the melancholy end of Charles I. rather promoted than retarded the vigour of commerce. They were the means of carrying abroad, with a fresh ardour, the energy and activity of industrious citizens; and a lucrative acquisition of external commerce became the most fertile source of both public and individual wealth. During the period which elapsed from the death of Charles I. to the abdication of James II., improvements in manufactures and trade advanced with rapidity. The naval war against the Dutch had curtailed the maritime power of that people, and had added to that of England; so that the Revolution found Britain a great commercial nation. The shipping was more than double what it had been left by James I.; many new branches of manufacture had been introduced; several new colonies had been established in America, and some were recovered from the power of the Dutch. In Jamaica—an island taken from the Spaniards during the protectorate—the foundations were laid of Britain's West Indian commerce; the destruction of much of the Dutch influence in the East gave new encouragement to the exertions of the East India Company; and in 1670 a board of trade was instituted for the purpose of consulting on and protecting the interests of commerce. All these circumstances were greatly favoured by the Revolution—an event which strictly defined the rights of the crown, ensured political and religious liberty, and secured to the subjects their property and their personal rights. The progress of arts and commerce, and the accumulation of wealth, have since then gone on unceasingly, if now and then checked to some extent by wars or other causes. Some particulars of the various British manufacturing industries are given below; but although the value of goods exported may be stated there is no means of arriving at the values of those consumed in the country.

Cotton Manufacture.—Though of modern origin, this is the most important of British manufactures. It is referred to only once, and that incidentally, in Adam Smith's *Wealth of Nations* (1776), but by the end of the eighteenth century, owing to the introduction of the machines of Hargreaves, Arkwright, and Crompton, and the extended use of steam-power, it had firmly established itself as one of the leading industries. It was in the cotton manufacture that the factory system first ousted the domestic or cottage system of industry, and in consequence those

evils that led later to special legislation were first manifested here. "In this branch of industry Great Britain still remains a long distance ahead of any other country, a superiority which it owes partly to its position, being conveniently situated both for receiving supplies of the raw material from its chief source, the Southern States of the Union, and for sending out again supplies of the manufactured cotton to European and other countries where a demand for it exists—partly also to its great wealth in coal. The chief seat of the manufacture is in Lancashire, where Manchester and a number of other large towns, such as Oldham, Bolton, and Preston, are more or less supported, directly or indirectly, by this industry. The cotton manufacture of Scotland is on a comparatively limited scale, and is even of less importance than formerly. It chiefly centres in Glasgow and the surrounding district. Cotton thread is made more extensively at Paisley than at any other place in the world. The immense importance of the cotton manufacture will be understood from the fact that it gives employment to about 520,000 persons, while the cotton goods exported (not to speak of those consumed in the country) form the largest individual export among the numerous exports sent by Britain to foreign countries. During the three years 1889–90–91 the annual export of cotton goods had an average value of fully £72,000,000; since that time it has somewhat decreased, the annual value in 1896–97–98 being a little over £66,000,000. The raw cotton imported has in recent years had a value of from £80,000,000 to more than £46,000,000 annually. The latter figure represents the value for 1891, while a larger quantity in 1898 was valued at only £34,000,000. The quantity imported, which in 1820 only amounted to 152,000,000 lbs., has lately been more than 1,900,000,000 lbs. in some years.

Woolen Manufacture.—This is the most ancient, and was for centuries the great staple English manufacture. There cannot be a doubt, however, that the first great improvements were not of native invention, but were introduced by foreigners, whom either the wise policy of sovereigns had allured, or the merciless bigotry of their own sovereigns had driven into the kingdom. Though the manufacture cannot boast of an extension like that of cotton, it holds the next place to it among textiles; and, besides working up the greater part of the wool grown within the kingdom, draws largely on other countries for additional supplies, particularly on the Australian colonies. In some branches the British manufacturers have formidable competitors on the Continent, but in others the position of the United Kingdom is at least as high as that of any other country, while in not a few the superiority is decided. The chief centres of the woollen manufacture are in England—the West Riding of Yorkshire (Leeds, Huddersfield, &c.), Lancashire, Gloucestershire, and Wiltshire being the most distinguished for broadcloths; Bradford and Norfolk for worsted stuffs; Leicestershire and Nottinghamshire for woollen hosiery. Blankets and flannels have numerous localities, but for the finer qualities the West of England and several of the Welsh counties are most conspicuous. Carpets, of every quality and pattern, are extensively made at Kidderminster, Halifax, Worcester, &c.; and Wilton and Axminster have given their names to famous fabrics of this kind. A modern branch of the woollen manufacture is that of *shoddy*. Its raw material consists of woollen rags, which, being reduced to the state of wool, are then re-manufactured. The principal seat of the shoddy trade is the Leeds district. The woollen manufacture of Ireland is on a rather limited scale, but seems to be making some progress. Among the goods made are blankets and flannels,

frizes, tweeds, and serges—Irish wool being chiefly used. Scotland has made much more progress, but still bears no proportion to England. The chief seats of the Scotch woollens are Kilmarnock for carpets, bonnets, &c.; Glasgow for carpets, &c.; Stirling and its neighbourhood for carpets and tartans; Galaahels, Hawick, Selkirk, and other places in the basin of the Tweed for shawls, plaids, &c., and still more for the kind of cloth known as 'tweeds', the manufacture of which originated here, and which are also made at Dumfries and Aberdeen; Hawick for hosiery; Alloa for yarn. The woollen manufacture in all its branches gives employment to about 282,000 persons, while the value of the woollen and worsted manufactures (including yarn) exported from Great Britain has in recent years varied from more than £25,000,000 per annum to less than £20,000,000.

Linen.—In England the spinning of flax into yarn and the weaving of the yarn into cloth is an old industry, and is carried on to a great extent, but is apparently not increasing. The chief seat of the manufacture is the West Riding of Yorkshire, the chief towns engaged in the industry being Leeds and Barnsley. Linen is the great staple of Ireland, where it is carried on chiefly in the province of Ulster (counties of Antrim, Down, Tyrone, &c.); and in Scotland also it was long the staple among textile fabrics. In the former, extraordinary means were employed to foster it. It early fixed its seat in the *x*, particularly near Belfast, which is still its great centre. The forms into which flax is manufactured in Ireland include not only plain linens, but also many of the finer varieties—lawn, cambric, damask, &c. In Scotland the manufacture also assumes great variety, embracing coarse goods such as osenaburghs, sheetings, sacking, &c.—chief seat, Dundee; and diaper and damask—chief seat, Dunfermline. The staples of both towns are by far the most important of their kind in the kingdom; and the Dunfermline table-linens are not surpassed anywhere. Large quantities of jute goods have been manufactured for a considerable number of years, especially at Dundee. The value of the linen and jute manufactures (including yarn) exported in 1883 was £9,267,946, the average for the three years 1896-97-98 was rather less than £6,000,000.

Silk.—In the case of silk, as in that of cotton, the raw material is entirely of foreign production. The chief source of supply is China, from which is obtained more than three-fourths of the raw silk consumed in the United Kingdom; and after China the next countries in order of importance in this regard are France, Japan, and British India. The silk manufacture, however, can hardly be regarded as a very important British industry. The silk-mills are confined chiefly to Macclesfield, the chief seats being London, Manchester, Macclesfield, and Coventry. The silk manufactures exported are of trifling value compared with those imported.

Machinery and Metal Goods.—The manufacture of machinery of all kinds is an extremely important branch of the industry of the United Kingdom, embracing steam-engines, textile machinery, agricultural machinery, sewing-machines, and various other descriptions. In 1898 steam-engines of various kinds were exported to the value of £3,600,000; and the total exports of machinery were valued at £18,390,000. Here should also be mentioned plate and sheet iron, tin-plates, rails and railway materials, wire, bars, hoops, tubes, &c.; as well as guns and war material, tools and implements of various kinds, telegraphic and electric apparatus. For minuter articles of hardware reference may be made to the countless products such as Sheffield and Birmingham produce, not ex-

cluding articles in the precious metals—plate, jewelry, and watches, made extensively in various places, but nowhere in the wide world so perfectly as in London. The exports of hardware and cutlery in 1897 amounted to £2,104,009; of steel and iron and other manufactures thereof to £24,641,616.

Miscellaneous Manufactures.—Very extensive are the manufactures of clothing, haberdashery, and millinery, and of vehicles, furniture, cabinet and upholstery wares. So also are the industries connected with earthenware, both in the more ordinary forms of pottery and in that of porcelain, with its classic shapes and gorgeous colours and exquisite designs. Among earthenware, at least as to principal constituents, we may include glass in its various forms, the principal of which are window-glass and bottles. Another manufacture is that of paper in all its different varieties. In connection with it are various industries, of which it may be considered as, directly or indirectly, the parent—type-founding, printing, books, newspapers, and with them literature in its various departments, engraving, &c. Besides the various classes of paper and stationery exported there is of course an immense consumption at home. Among other important miscellaneous manufactures are those of chemicals, manures, leather and leather goods (boots and shoes, saddlery), india-rubber goods, floorcloth, &c. Here may also be mentioned preserved provisions, confectionery, spirits, and ales.

Ship-building.—The chief seats of British ship-building are Glasgow and other Clyde ports, Newcastle and other Tyne ports, Sunderland, Hartlepool, Belfast, Stockton, Middlesbrough, London, and Barrow-in-Furness. In 1883 the total number of sailing vessels built was 379, with a tonnage of 148,090; of steam-vessels, 1028, with a gross tonnage of 744,126; or in all, 1407 vessels, with a total tonnage of 892,216. The output for 1898 was 665 sailing vessels, with a net tonnage of 41,839; 705 steam-vessels, with a net tonnage of 654,158 (1,079,583 tons gross); or in all, 1370 vessels, with a total net tonnage of 696,997. Besides these there were built for foreigners 196 sailing and steam vessels, having a total net tonnage of 174,611 tons; the steamers numbering 165, with a net tonnage of 171,560 and a gross tonnage of 278,955.

Exports and Imports.—Of the extent of the commerce carried on by railway, river, canal, and highway we have little or no means of forming an estimate, though it must be of enormous extent. The foreign trade, or commerce properly so called, is more easily calculated, at least in all its leading branches, and the magnitude to which it has attained is so great, and the strides with which it has advanced have been so rapid, that it is impossible to contemplate it without astonishment. The following table will show the rapid progress it has made, and the extent it has attained:—

Years	Imports.	Exports.		
		British Produce.	Foreign and Colonial Produce.	Total Exports.
	£	£	£	£
1856	172,544,154	115,828,948	23,895,405	139,220,815
1878	371,287,372	265,164,603	56,330,102	321,914,765
1880	411,229,561	328,000,446	63,354,020	391,414,466
1883	420,891,579	329,799,478	65,637,697	395,437,070
1892	423,892,178	237,060,224	64,400,420	301,460,644
1897	451,238,083	234,350,003	69,833,477	304,183,480
1900	523,075,163	291,101,999	63,181,768	354,373,767

In 1856 the imports per head of the population amounted to £6, 8s. 2d.; the exports of British produce, to £4, 2s. 10d. In 1898 the amounts were respectively £11, 14s. 1d. and £5, 16s. 2d.

The values of the chief articles of export and import, in 1891 and 1898, were as follows:—

Chief Imports to Britain.

	1891.	1898.
	£	£
Animals (cattle, sheep, horses, &c.)	9,678,666	11,583,173
Bacon, pork, and hams	10,040,418	18,701,671
Beef, mutton, and other dead meat	9,820,477	11,583,173
Butter and margarine	15,149,384	18,840,167
Cattle and sheep and their manufactures	9,714,823	9,674,873
Cheese and imitations	4,519,104	4,966,569
Chemicals, drugs, dyes, &c.	7,314,337	6,548,638
Clothes, watches, and parts thereof	1,149,979	1,868,338
Cocoa and chocolate	998,000	2,000,568
Coffee	8,443,796	8,590,871
Corn of all kinds and flour	61,571,504	62,909,000
Cotton	44,080,719	54,417,687
Cotton manufactures	2,708,967	4,383,493
Eggs	8,520,918	4,467,117
Fish of all sorts (including turtle)	2,806,949	5,892,801
Flax, hemp, and substitutes	5,906,331	5,217,088
Fruits and vegetables	5,538,774	12,171,861
Glass and glass manufactures	2,259,376	3,255,536
Hides and leather	9,069,060	10,694,225
Iron, unmanufactured	4,208,658	8,855,899
Lard and imitations	1,720,051	2,976,826
Leather manufactures	3,621,086	3,014,008
Manures	2,571,797	2,025,806
Metals—Copper and copper-ore	6,431,778	9,674,510
Iron and steel, wrought and unwrought, and ore	3,293,562	5,451,245
Iron and steel manufactures	5,482,827	7,321,577
Lead and lead manufactures	2,187,674	2,897,229
Tin and tin manufactures	2,865,074	1,650,294
Zinc and zinc manufactures	1,543,901	3,142,432
Musical instruments	1,032,391	1,920,512
Oil (including petroleum)	7,339,994	8,099,510
Paper and paper materials	4,630,530	6,514,889
Potatoes	1,196,324	1,918,912
Rice	2,795,559	2,005,620
Seeds	7,153,739	6,745,976
Silk, raw	2,128,150	8,196,665
Silk, manufactured	11,017,167	16,623,230
Skins and furs	4,645,994	4,881,487
Spirits	3,245,400	1,906,977
Sugar, raw	10,512,853	8,131,763
Sugar, refined	9,545,897	10,168,683
Tallow and stearine	1,772,398	3,085,433
Tee	10,775,845	10,387,953
Tobacco, including cigars, &c.	3,414,400	3,897,010
Wine	5,995,133	6,675,991
Wood and timber	14,928,571	23,438,546
Wool	27,856,556	27,780,027
Woolen manufactures	9,576,179	9,914,189

Chief Exports of British Produce from Britain.

	1891.	1898.
	£	£
Alkali	2,335,112	1,005,768
Apparel and cloths	5,150,212	4,695,980
Arms, ammunition, &c.	1,681,566	2,477,554
Beer and ale	1,694,567	1,623,183
Books, printed	1,386,669	1,386,549
Cattle and sheep manufactures	1,242,794	1,822,702
Carriages, including cycles	6,546,947	8,255,433
Chemicals, drugs, dyestuffs, &c.	18,594,729	19,659,498
Coal, coke, &c.	8,828,102	2,796,789
Copper, wrought and unwrought	60,240,769	56,977,506
Cotton manufactures	11,189,945	8,923,272
Cotton yarn	1,956,770	1,819,515
Earthenware and chinaware	1,710,617	2,582,380
Fish	2,323,595	1,504,519
Haberdashery and millinery	8,839,411	1,986,692
Hardware and cutlery	26,574,784	22,630,272
Iron and steel and their manufactures	2,452,170	2,323,732
Leather and articles of leather	8,659,831	8,354,854
Linen manufactures	5,031,066	4,892,954
Machinery, steam-engines	8,830,170	3,623,462
Other machinery	11,890,146	14,763,511
Manure	2,111,360	2,173,355
Paper and stationery	2,648,538	2,419,476
Silk manufactures	1,744,723	1,623,952
Spirits	1,336,848	2,021,140
Woolen and worsted yarn	6,042,547	6,443,739
Woolen and worsted manufactures	18,451,981	18,699,435

The following table shows the relative extent to which Great Britain trades with different foreign countries and British possessions, and the value in 1898 of the imports from and exports to these countries respectively:—

Imports from and Exports to British Possessions in 1898.

Countries.	Imports.	Exports.
Australian colonies and Fiji	£23,850,384	£23,400,005
Islands	27,470,081	30,892,334
British India	10,541,136	18,147,638
Cape Colony and Natal	2,610,805	2,851,873
Other African possessions	4,847,721	1,240,458
Ceylon	726,887	2,347,089
Hong Kong	20,754,642	7,541,103
Canada and Newfoundland	5,941,900	5,316,850
Straits Settlements	2,105,895	3,030,456
West Indies		
<i>Imports from and Exports to Foreign Countries in 1898.</i>		
Argentine Republic	7,788,833	5,812,776
Austria-Hungary	1,135,482	2,237,595
Belgium	21,534,318	18,586,902
Brazil	4,001,773	4,460,908
Chili and Bolivia	3,633,552	1,855,771
China	2,865,064	5,090,497
Columbia, Ecuador, Venezuela	945,251	1,629,983
Denmark and Danish possess.	11,736,716	3,272,890
Egypt	8,855,899	4,626,881
France and French possessions	52,697,571	21,714,596
Germany and German possess.	22,599,862	23,468,232
Greece	1,445,353	1,259,107
Holland and Dutch possessions	29,009,117	18,904,641
Italy and Italian possessions	8,832,512	2,564,700
Japan	1,155,134	5,062,150
Mexico and Central America	859,293	2,486,912
Peru	1,537,423	920,024
Portugal and Portuguese posses.	8,805,284	3,980,187
Roumania	2,579,801	1,255,002
Russia	19,459,514	14,137,308
Spain and Spanish possessions	18,922,454	4,007,714
Sweden and Norway	14,723,451	5,604,731
Turkey, with Bulgaria, &c.	5,115,478	6,939,099
United States and its posses.	127,677,513	29,874,425
Uruguay and Paraguay	392,014	1,812,919

The total imports from British possessions in 1898 were of the value of £29,493,955, the exports to these possessions £20,110,736; imports from foreign countries, £370,944,628; exports, £203,905,252.

Shipping.—The registered sailing vessels engaged in the home trade of the United Kingdom were, in 1898, 6521; their tonnage 407,628; their crews numbered 26,989. The steam vessels in the home trade were 3102, with a tonnage of 438,882, and crews numbering 35,682 men. The vessels engaged partly in the home, partly in the foreign trade, numbered 519, their tonnage 291,318, and their crews 7837. The sailing vessels in the foreign trade were in 1898, 1388, of 1,878,896 tons, and 81,063 men; steam vessels 3677, burden 6,064,506 tons, crews 140,982. The total number of vessels employed in the trade of the United Kingdom was thus 15,207, with an aggregate burden of 9,080,728 tons, and crews numbering in all 242,553. The total number of vessels registered as belonging to the kingdom was 20,404 of 9,001,860 tons.

Education.—Since 1870 education has made great advances in all the divisions of the United Kingdom. In that year a comprehensive measure (with compulsory clauses) for the promotion of elementary education in England was passed by the state. Its chief provisions were for the election of School Boards in districts in which there was a deficiency of school accommodation, with power to build and maintain schools out of rates levied for the purpose, and for the giving of aid by parliamentary grant to these board schools as well as to previously existing schools. As the result of this act the whole country was mapped out into school districts, School Boards were established in London and in all the school districts where there was a deficiency of school accommodation, and these School Boards were permitted to make a compulsory bye-law for their dis-

tricta. These provisions were supplemented in 1876 by an act which provided that each school district which had no School Board should at least have a School Attendance Committee. It was found, also, that the discretionary power given to School Boards to enforce the attendance of children in their districts did not secure the best results, and so it was enacted in 1880 that every School Board and every School Attendance Committee was absolutely required to make and enforce bye-laws for compulsory attendance. The school attendance age, as now enforced by law, is from 5 to 14 years, but whole or partial exemption may be granted to pupils who are not less than 12 years, and who have passed the 5th standard. In 1898 there were in England and Wales 2502 School Boards, embracing in their operations a population of 19,916,110, and 785 School Attendance Committees, embracing a population of 9,084,415. The proceedings of these bodies and the manner in which they administer the acts are reported by H.M. Inspectors to the Education Office. The Scotch Education Act, passed in 1872, was from the first a comprehensive measure, which required the election of School Boards in every burgh and parish, and made school attendance compulsory throughout the country, the school age being from 5 to 14 years. The child, however, can leave school when he has passed the 5th standard and is twelve years of age. It was provided, by legislation in 1889, that the elementary education of Scotland should be almost entirely free; and in 1891 enactments were passed to make it entirely free, both in England and in Scotland. In 1897 an act was passed providing for money grants to necessitous voluntary schools. In Ireland, which is still far behind England and Scotland, elementary education is under the superintendence of a body of Commissioners of National Education, created in 1845, with powers to erect and maintain such schools as they thought necessary. There is, however, no compulsory school attendance in any part of Ireland. The Education Acts in England and Wales are administered under the general superintendence of the Board of Education, established in 1900, Scotland being under a special department. Of the schools in England and Wales in 1897, 5539 with 2,028,850 pupils in average attendance were directly under School Boards, while 11,831 with 1,869,818 pupils were connected with the National Society. The average number of children in daily attendance in England and Wales was 4,488,543; in Scotland, 605,389. In Ireland the schools in operation were 8681, and the average attendance was 521,141. The grants to elementary schools were in 1898—England, £7,565,359; Scotland, £1,072,195; Ireland, £1,311,670. Besides these grants the schools have an income from endowments, school fees, local rates, &c. There are a number of training colleges for teachers, organized mostly in connection with the different religious bodies.

Secondary education in the United Kingdom is not as yet organized by the state. A return issued in 1896 groups the secondary schools of England into five classes, namely, Private Enterprise, Subscribers', Companies', Endowed, and those under Local Authority. The total number of schools sending returns was 6209. The number of pupils was 291,544. The Private Enterprise schools numbered 5187; the Endowed, 619. Of the latter class many are known as grammar schools. A special class may be said to consist of the great public schools of Eton, Harrow, Rugby, Winchester, &c. In Scotland there are many higher class schools, and also secondary departments in other schools under the School Boards. Technical education received a great impetus from the passing of various acts from 1889 onwards.

For the higher education there are in England the Universities of Oxford, Cambridge, London, Durham, the Victoria University, the University of Wales, and the Birmingham University. In addition to these there are colleges, some of them called 'University Colleges', at Nottingham, Bristol, and other places (some of them for women), and the colleges belonging to the different religious bodies. Till 1900 London University granted degrees, but did not teach; it is now, however, a teaching university, having in connection with and forming schools of it, University College, King's College, and other institutions. In Scotland there are the four universities of Edinburgh, Glasgow, Aberdeen, and St. Andrews; a university college at Dundee incorporated with St. Andrews University; St. Mungo's College, and Anderson's College Medical School, Glasgow. Ireland has the University of Dublin, the Queen's Colleges of Belfast, Cork, and Galway in connection with the Royal University of Ireland (which is merely an examining and degree-conferring body), the Roman Catholic University in connection with Maynooth and other Roman Catholic colleges. A medical education may be obtained at the various universities and colleges, or in connection with the chief hospitals.

Religion.—Every form of religion enjoys the most complete toleration, but there are two churches, one in England having an Episcopal form of government, and one in Scotland with a Presbyterian organization, established by law and partly supported by state endowments. The Church of England has two archbishops, over thirty diocesan bishops, and a number of suffragan bishops, besides colonial and missionary bishops. There are about 14,000 parishes, the income in about half being under £130 per annum; the total number of clergy is about 23,000. The church population is not known with certainty, but estimates make it from 14,000,000 to 16,000,000. The chief religious bodies in England outside of the Established Church are the Methodists in their several branches, the Independents or Congregationalists, and the Baptists. The Established Church of Scotland includes about 1800 ministers and licentiates engaged in ministerial work, and the number of communicants is said to be over 640,000. The total number of parishes, old and new, together with mission stations, is about 1760, old parishes numbering about 900. The chief non-established church of Scotland is the United Free Church, formed in 1900 by the union of the Free Church and the United Presbyterian Church. The Episcopal Church in Scotland is also a body of some importance, and so is the Roman Catholic. Both in England and Scotland the great majority of those who do not belong to the Established Church are Protestants. In England, however, dissenters nearly all belong to churches having a different organization from that of the Anglican Church, while in Scotland most of them are Presbyterians, and thus differ little from members of the Established Church as regards creed and organization. In Ireland there has been no state church since 1871, when the branch of the Anglican Church which had long been there established was disestablished. It still occupies an important position, and is under two archbishops and eleven bishops. The great majority of the people, however, are Roman Catholics. The census takes no account of religious belief, except in Ireland, where the returns of 1891 showed 3,547,307 Roman Catholics, 600,103 Anglicans, and 444,974 Presbyterians. The number of Roman Catholics in the three kingdoms is about five-and-a-half millions. The number of Jews is about 94,000, of whom nearly three-fourths are in London.

People: Social State.—Owing to a great variety

of causes, some of them connected with natural resources and geographical position and others with the national character, the people of the United Kingdom enjoy perhaps a greater degree of prosperity and freedom than any other nation. But to this general comparative prosperity there is a darker side. The great development of manufactures, itself one of the causes of Britain's favourable position among the nations of the world, has, by leading to the overcrowding of large numbers in great towns, produced many gigantic evils. In 1898 there were 84 towns with over 100,000 inhabitants, and more than 70 with over 50,000; and besides London there were 4 cities—Glasgow, Liverpool, Manchester, and Birmingham—containing over half a million inhabitants each. The evils referred to have now for many years received the careful attention of humanitarians and experts, and in consequence much has been done by legislation and other means to diminish them. In particular, the condition of the great cities has been enormously improved in respect of sanitation, though much still remains to be done in this direction. One of the most serious causes of poverty and misery, want of employment, has of late years attracted much attention, particularly at times when various natural causes conspired to aggravate it. The classes most severely affected by this cause are those who, though not paupers, are virtually always on the brink of pauperism; and there is some reason to believe that this class is not diminishing in numbers. The numbers of persons committed for trial and convicted show a decided decrease in recent years. In 1897 the number committed at assizes, quarter-sessions, &c., was 15,429, of whom 12,029 were convicted. During the period 1888-97 the number sentenced to death in England and Wales averaged 24·4 per annum; to penal servitude for life, 2·6; to penal servitude for a term of years by ordinary courts, 840·1; to imprisonment on indictment, 7709·3; to imprisonment on summary conviction or for want of sureties, 142,017·5. In dealing with the statistics of crime it is important to bear in mind that of recent years several new offences have been created, and extended powers have been granted in connection with others; and there has probably been increased efficiency in detecting crime. The rate of mortality has been reduced considerably since the beginning of the nineteenth century, and further improvement in this direction may still be expected. Emigration from the United Kingdom to countries out of Europe has lately been declining. In 1898 the total number was 140,644, of whom 80,494 went to the United States; whereas in 1883 the number was 320,118, of whom 191,573 settled in the United States. The number of immigrants into the United Kingdom increased annually from 1888 till 1890, then decreased till 1893, reached a very high figure (185,799) in 1894, and again decreased to 139,346 in 1896. With regard to occupations and pursuits the census of 1891 gave the following returns for England and Wales, Scotland, and Ireland:—Professional class, 812,242 males, 499,452 females—total 1,251,694; domestic class, 188,865 males, 2,170,260 females—total 2,858,625; commercial class, 1,818,065 males, 47,795 females—total 1,668,860; agricultural and fishing class, 2,849,652 males, 173,176 females—total 2,622,828; industrial class, 6,641,637 males, 2,883,521 females—total 9,025,158; others, 3,245,676 males, 10,716,413 females—total 13,962,089.

Extent of Empire.—The European dominions of the British Empire comprise—in addition to Great Britain, Ireland, the Isle of Man, and the Channel Islands—the rocky promontory of Gibraltar, captured from Spain in 1704; and Malta, Gozo, and adjacent islets, ceded to Britain in 1800. The most

important of the Asiatic possessions of Britain is India, acquired gradually since the incorporation of the East India Company in 1600, and especially during the great struggle with France in the eighteenth century. Britain also possesses Ceylon, acquired by conquest from the Dutch and from native rulers in 1796-1815; the Straits Settlements of Singapore (ceded in 1824), Penang (1786), Wellesley Province (1800), and Malacca (1824), on which are dependent various native states of the Malay peninsula; the island of Hong Kong (taken in 1841) and territory on the adjacent mainland; portions of the island of Borneo, namely British North Borneo (company chartered in 1881), to which is attached the island of Labuan (ceded 1846), the sultanate of Brunel, and Sarawak (practically British since 1842); Aden (1839), the island of Perim, the Kooria Moorla Islands, and the Bahrein Islands. Cyprus, though belonging to Turkey, has since 1878 been administered by Britain. In Africa Britain owns Cape Colony, gradually developed since its final acquirement in 1806, and including Walfisch Bay; Basutoland (British since 1868); the Bechuanaland Protectorate (acquired in 1884); Natal (proclaimed British in 1843), to which are now annexed Zululand and Tongaland (acquired in 1887); Rhodesia, including Matabeleland, Mashonaland, Barotseland, &c., recently begun to be developed by the British South Africa Company; the Central Africa Protectorate (acquired in 1899-90, and proclaimed a protectorate in 1891); the West African Colonies, namely, Gambia (recognized as British in 1783), the Gold Coast (partly acquired in the seventeenth century), Sierra Leone (ceded 1787), and Lagos, with dependencies (occupied in 1861); Nigeria, including the Niger Coast Protectorate (1884) and the territories formerly administered by the Royal Niger Company (chartered in 1886); the East Africa Protectorate, proclaimed in 1895 over territories previously under the Imperial British East Africa Company (chartered 1888); the Uganda Protectorate, now including also Unyoro, Usoga, &c. (proclaimed in 1894); the Zanzibar Protectorate, consisting of the islands of Zanzibar and Pemba (under the protection of Britain since 1890); the Somali Coast Protectorate (acquired in 1884); the island of Mauritius (taken from France in 1810), with its dependencies the Seychelles, &c.; the island of Socotra (1868); and the Atlantic islands, St. Helena (1651), Ascension (1815), and Tristan d'Acunha (1816). Besides, Britain virtually rules Egypt and the recently reconquered Egyptian Sudan (1898), though the former is nominally part of the Ottoman Empire; and she practically possesses the former territories of the Orange Free State and the Transvaal. Her possessions in the New World comprise the Dominion of Canada, most of which was obtained from France by conquest and treaty between 1713 and 1763; the island of Newfoundland, the oldest English colony (discovered by John Cabot in 1497), with its dependency Labrador; British Honduras (1783); the Bermuda Islands (1609); the West Indian Islands, namely, Jamaica (1655), the Bahamas (1629), several of the Leeward Islands (Antigua, St. Christopher, Dominica, &c.), the Windward Islands (Barbados, St. Lucia, St. Vincent, Grenada, the Grenadines, Tobago, &c.), and Trinidad (1797); British Guiana (1814); and the Falkland Islands (organized 1883) and South Georgia. The British Empire in Australasia includes Australia (explored and settled from the latter part of the eighteenth century onwards); Tasmania (settled by Englishmen in 1803); New Zealand (began to be colonized in 1839); a portion of New Guinea (1884); the Fiji Islands (1874); and many small islands in the Pacific. See the following table.

Area and Population of the British Empire.

EMPIRE.	Area in sq. m.	Population.
British Isles (1901).....	129,979	41,005,177
Gibraltar	138	25,895
Malta and Gozo	117	155,562
ASIA.		
British India (including feudatory states, area 732,000 sq. m., pop. 68,161,569).....	1,800,958	294,365,000
Ceylon	25,400,000	5,400,000
Straits Settlements	1,472	520,000
Hong Kong	80	260,000
N. Borneo, Sarawak, Brunel, Labuan	84,140	500,000
Aden and Perim	80	42,000
Other possessions (Kooria-Mooria Islands, Bahrain Islands, Keeling Islands, &c.).....	850	70,000
Cyprus	3,584	225,000
AFRICA.		
Cape Colony	276,800	2,300,000
Natal and Zululand	34,700	328,500
Basutoland	10,243	250,000
Bechuanaland Protectorate	213,000	200,000

AFRICA (continued).	Area in sq. m.	Population.
Transvaal and Orange River Col. Rhodesia, &c.	176,000	1,300,000
British East Africa, Uganda, &c.	468,000	2,500,000
Northern and Southern Nigeria	1,300,000	18,000,000
Mauritania and dependencies	585,000	24,000,000
Other possessions (Sierra Leone, Gambia, Gold Coast, Lagos, St. Helena, Ascension, &c.)	580	800,000
AMERICA.		
Dominion of Canada	74,300	1,875,000
Newfoundland and Labrador	3,456,383	5,490,000
West Indies and Bermudas	162,300	268,000
Honduras	12,490	1,840,000
British Guiana	7,562	94,277
Falkland Islands, &c.	109,000	263,315
AUSTRALASIA.		
Australia	7,500	2,060
Tasmania	2,946,091	3,574,320
New Zealand	26,885	182,500
New Guinea	104,471	768,000
Fiji Islands	84,600	185,000
Other Pacific Islands	8,045	121,759
Total (in round numbers) ..	11,772,000	400,000,000

POPULATION OF ENGLAND AND WALES.

COUNTIES.	Area in Acres.	POPULATION IN									
		1851.	1861.	1871.	1881.	1891.	1901.	1911.	1921.	1931.	1941.
Bedford	303,954	95,483	107,986	124,478	135,287	146,257	149,567	100,704	171,849		
Berk	463,267	140,234	161,789	170,055	176,256	190,475	218,303	232,790	264,981		
Buckingham	479,358	146,977	166,489	163,723	167,993	175,879	176,155	188,294	195,584		
Cambridge	559,331	148,065	164,459	185,405	176,018	186,906	185,706	188,961	190,667		
Chester	554,353	934,301	895,869	455,725	565,438	561,301	644,400	766,458	780,068	814,556	
Cornwall	868,208	801,306	842,159	855,553	869,390	862,843	883,686	922,571	938,867		
Cumberland	970,161	169,262	178,038	195,492	206,376	220,253	250,447	266,540	296,021		
Derby	632,261	237,170	272,202	296,084	339,327	379,394	401,746	575,033	620,196		
Devon	1,671,111	408,006	538,959	567,098	684,373	601,374	603,654	631,086	680,444		
Dorset	625,580	156,385	176,054	184,207	188,789	196,537	197,476	194,017	202,962		
Durham	649,244	309,256	307,063	300,907	508,066	506,899	507,470	1,015,350	1,187,824		
Essex	979,532	317,507	344,979	369,318	404,861	466,436	476,458	765,445	858,066		
Gloucester	802,643	187,398	431,495	458,805	485,770	534,640	572,341	590,047	684,066		
Hampshire	1,052,810	313,978	354,682	405,370	481,815	544,084	598,465	680,097	768,756		
Hereford	588,984	110,617	118,272	115,489	123,712	125,370	121,340	115,949	114,401		
Hertford	404,518	142,844	156,060	167,298	173,280	192,226	203,140	220,162	250,850		
Huntingdon	288,977	53,192	65,449	64,183	64,250	63,708	59,491	57,701	61,775		
Kent	975,060	479,568	549,553	615,706	738,887	848,294	977,707	1,145,324	1,361,498		
Leicester	1,197,213	1,356,554	1,607,054	2,031,236	2,429,440	2,819,495	3,464,438	3,926,760	4,406,787		
Leicester	532,788	197,003	215,867	230,308	237,412	269,311	321,430	375,584	438,994		
Lincoln	1,096,440	317,465	362,002	407,222	412,246	436,590	460,919	472,878	498,781		
Middlesex	148,865	1,858,339	1,576,636	1,886,576	2,206,485	2,589,769	2,920,485	3,261,071	3,585,139		
Monmouth	649,119	86,120	134,308	167,419	174,633	198,448	211,172	232,418	295,827		
Norfolk	1,314,503	900,054	412,904	442,711	484,798	438,556	444,637	454,516	507,878		
Northampton	638,619	179,330	199,228	212,350	227,704	243,891	272,558	302,193	338,064		
Northumberland	1,291,514	236,590	296,020	304,568	343,025	386,646	438,711	506,030	602,650		
Nottingham	540,117	225,337	249,910	270,427	293,867	319,758	301,815	445,828	514,587		
Oxford	480,668	153,536	163,127	170,439	170,944	177,975	179,559	185,669	195,798		
Rutland	97,478	19,365	21,302	22,983	21,861	22,073	21,484	30,609	19,706		
Salop	861,809	213,518	225,820	229,341	240,950	249,111	248,092	256,839	280,351		
Somerset	1,039,711	403,795	435,599	443,016	444,873	468,483	469,100	484,337	506,104		
Stafford	744,918	406,480	509,472	606,716	746,943	858,326	961,000	1,083,408	1,234,322		
Stafford	949,765	296,317	315,073	337,315	337,070	344,839	356,893	371,235	394,108		
Surrey	401,791	486,434	534,036	684,082	831,093	1,001,035	1,436,899	1,781,943	2,006,923		
Sussex	952,536	272,044	300,075	350,844	365,735	417,465	490,550	550,446	608,052		
Warwick	579,851	336,844	402,769	473,918	494,180	564,180	737,339	805,072	897,678		
Westmoreland	505,830	55,041	56,454	68,287	60,817	65,010	64,191	66,008	64,305		
Wilt	806,443	237,244	256,280	254,221	249,311	257,177	258,970	264,967	278,545		
Worcester	480,064	222,656	248,450	276,926	307,397	338,837	360,283	418,760	498,401		
York (East Riding) ..	753,627	168,991	194,936	220,943	240,327	268,466	309,408	341,546	367,319		
— (City)		26,290	28,842	36,303	40,493	43,796	61,789	67,064	87,738		
— (North Riding) ..	1,802,819	192,250	204,701	215,214	226,276	244,154	260,078	280,383	300,143		
— (West Riding) ..	1,771,549	984,009	1,168,680	1,325,495	1,507,790	1,874,611	2,174,737	2,439,895	2,746,897		
London, County of ..	75,459										
(Population of London included in respective counties above.)											
ENGLAND	33,549,019	13,090,523	14,997,427	16,927,888	18,964,444	21,405,181	24,618,926	27,483,490	30,805,466		
Anglesey	175,886	48,325	50,891	57,327	54,609	51,040	51,416	50,098	50,506		
Brecon	469,894	47,768	55,608	61,474	61,627	59,901	57,746	62,630	60,327		
Cardigan	567,816	100,740	106,326	110,632	111,746	115,710	124,864	130,506	135,285		
Carmarthen	865,931	66,818	81,098	87,870	95,694	106,121	119,849	118,204	126,885		
Denbigh	498,084	82,695	88,478	92,583	100,778	105,102	111,967	117,872	128,065		
Flint	163,025	60,244	66,919	68,166	69,737	76,812	80,441	77,277	81,735		
Glamorgan	516,969	126,612	171,183	231,849	317,702	397,859	511,383	627,218	800,052		
Merioneth	423,017	85,315	89,832	88,848	86,968	86,599	81,967	49,212	49,160		
Montgomery	516,111	66,844	69,807	67,593	66,919	67,623	65,710	68,003	54,892		
Pembroke	392,710	81,426	88,044	94,140	91,968	91,834	86,870	80,183	88,749		
Radnor	301,164	24,743	25,458	24,716	25,382	25,480	23,528	31,791	23,283		
WALES	4,774,618	806,274	911,705	1,005,721	1,111,780	1,217,135	1,300,513	1,519,038	1,720,009		
Grand Total	37,323,637	13,896,797	16,914,143	17,937,609	20,066,224	22,622,316	25,974,439	29,002,528	32,525,075		

POPULATION OF SCOTLAND.

A Table showing the Population of the several Counties of Scotland as enumerated at the various Censuses, with the Area of each County (according to the Ordinance Survey).

COUNTIES.	Area in Acres.	Population in 1821.	Population in 1831.	Population in 1841.	Population in 1851.	Population in 1861.	Population in 1871.	Population in 1881.	Population in 1891.	Population in 1901.
Aberdeen	1,386,706	155,449	177,657	192,387	212,032	221,509	244,808	267,990	284,086	308,098
Argyll	2,025,154	97,316	100,078	97,371	89,286	79,734	76,078	76,408	74,085	73,068
Ayr	730,947	127,299	145,065	164,076	189,868	198,971	200,809	217,519	230,365	254,165
Banff	405,482	48,465	48,357	49,079	54,171	59,215	62,028	62,796	61,664	61,440
Berwick	203,900	83,385	84,048	84,458	86,297	86,613	86,486	85,592	82,290	80,708
Bute	140,455	13,797	14,151	15,740	16,808	16,381	16,977	17,657	18,404	18,641
Caithness	446,017	29,181	34,559	36,348	38,709	41,111	39,992	38,865	37,177	35,623
Clackmannan	56,160	19,263	14,729	19,155	20,051	21,450	23,747	25,690	28,140	31,964
Dumfries	170,922	27,317	33,211	44,206	45,103	52,084	58,557	75,383	98,014	113,927
Dumfriesshire	690,204	70,878	73,770	72,830	73,728	75,878	74,808	76,140	74,245	72,564
Edinburgh	236,537	101,614	219,545	222,454	259,435	273,907	328,879	389,164	454,276	487,702
Elgin or Moray	808,409	31,398	34,498	35,012	38,669	42,695	43,012	43,788	48,471	44,749
Fife	321,489	114,566	128,839	140,140	153,646	154,770	160,785	171,931	190,365	218,347
Forfar	362,162	113,555	139,606	170,483	191,384	204,425	237,567	266,360	277,735	293,780
Galloway	171,377	35,127	36,143	35,856	36,388	37,654	37,771	38,502	37,377	38,356
Inverness	2,784,384	89,861	94,707	97,799	95,500	88,888	87,531	90,454	90,121	89,790
Kincardine	245,259	29,118	31,431	33,075	34,598	34,468	34,630	34,464	35,492	40,596
Kirkcubright	55,849	7,702	6,072	8,763	8,924	7,977	7,168	6,697	6,673	6,981
Kirkcudbright	582,251	88,303	100,690	111,119	121,119	121,495	121,989	121,989	121,989	121,989
Leith	566,901	24,387	316,819	429,972	530,169	603,556	706,359	904,412	1,105,599	1,387,886
Linlithgow	177,310	22,085	23,201	26,872	30,185	38,045	40,965	43,510	42,806	44,796
Na haim	104,245	9,268	9,854	9,217	9,850	10,065	10,065	10,065	9,165	9,291
Orkney (with Shetland till 1889)	249,565	53,124	58,239	61,065	62,533	64,065	63,882	61,749	60,435	27,727
Perth	223,289	10,046	10,078	10,499	10,788	11,408	12,788	13,822	14,780	15,000
Perthshire	1,652,782	138,247	142,165	137,457	139,606	139,606	127,708	129,007	122,185	123,276
Renfrew	156,128	119,735	134,443	145,071	177,661	216,947	265,374	320,812	369,458	414,796
Ross & Cromarty	2,049,423	62,762	74,320	78,685	82,707	81,406	80,965	78,547	78,737	76,135
Rothesay	428,497	40,892	43,668	46,025	51,642	54,119	53,974	53,442	53,500	48,804
Shetland	172,550	6,937	6,833	7,990	9,809	10,449	14,005	25,564	27,712	28,856
Shetland	362,615	65,376	72,021	82,057	86,237	91,298	98,218	112,443	118,021	141,847
Stirling	296,645	25,480	25,618	24,782	25,763	24,817	24,312	24,370	21,398	21,329
Strathclyde	1,345,480	33,240	36,258	39,165	43,880	42,065	38,890	38,811	36,062	35,563
Wigtown	10,458,416	2,001,521	2,304,386	2,020,184	2,888,742	3,062,294	3,860,018	3,735,073	4,025,647	4,472,123

POPULATION OF IRELAND.

A Table showing the Population of the several Counties of Ireland as enumerated at the various Censuses, with the Area of each County in Statute Acres.

COUNTIES.	Area in Acres.	Population in 1821.	Population in 1831.	Population in 1841.	Population in 1851.	Population in 1861.	Population in 1871.	Population in 1881.	Population in 1891.	Population in 1901.
ULSTER.										
Antrim	768,749	282,860	314,608	360,875	361,045	378,588	404,015	421,943	430,865	461,240
Armagh	828,080	205,450	239,349	232,393	196,085	190,086	170,260	163,177	137,877	125,238
Cavan	477,399	195,078	228,050	243,168	174,071	165,006	140,785	139,478	111,917	97,368
Donegal	1,197,154	248,270	308,104	296,448	255,160	237,895	218,384	200,085	185,636	173,625
Down	610,730	328,410	352,571	361,446	391,972	390,892	393,449	372,107	359,784	339,356
Fermanagh	457,369	130,097	149,576	166,481	116,007	105,768	94,794	84,879	74,170	65,243
Londonderry	522,315	183,609	222,416	222,174	191,868	184,209	178,066	164,901	152,009	144,329
Monaghan	319,741	174,097	195,632	200,442	181,758	125,482	114,969	102,748	86,306	74,605
Tyrone	806,658	261,865	302,943	312,965	255,819	236,500	215,766	197,719	171,401	150,468
LEINSTER.										
Carlow	221,334	97,070	98,911	88,228	65,075	57,137	51,650	48,668	40,964	37,728
Dublin	226,696	355,802	588,604	372,773	401,002	410,252	405,262	418,010	416,860	447,862
Kildare	418,446	99,065	108,401	141,488	95,724	90,646	83,614	75,304	70,201	63,469
Kilkenny	500,732	151,046	193,024	202,420	158,748	124,615	109,379	99,331	87,496	78,821
King's County	494,985	131,088	144,029	116,837	112,080	100,043	79,267	72,552	65,563	60,129
Louth	209,409	107,570	112,391	115,401	82,350	71,094	64,501	61,009	52,647	46,821
Long	204,123	101,011	108,168	111,970	107,657	90,713	84,021	77,984	71,914	65,741
Meath	579,651	159,183	177,023	183,828	140,750	110,873	95,558	87,469	76,111	67,453
Queen's County	424,746	121,275	145,849	153,980	111,023	100,656	70,771	73,129	64,855	57,527
Westmeath	455,458	129,119	136,799	141,300	111,409	90,670	78,432	71,708	68,611	61,622
Wexford	578,548	170,806	182,991	202,023	180,159	143,056	122,666	123,854	112,063	103,800
Wicklow	500,778	110,767	122,301	126,143	96,078	78,607	70,869	70,386	64,492	60,079
CONNAUGHT.										
Galway	1,569,605	337,374	427,407	440,198	322,259	271,478	249,720	242,005	211,227	192,149
Leitrim	1,840,663	730,745	812,907	854,118	114,918	104,744	96,062	90,372	80,372	70,301
Mayo	1,360,731	293,112	347,956	368,887	274,830	254,796	244,768	246,312	218,698	202,627
Monaghan	607,691	208,729	239,063	253,501	174,402	157,272	140,670	132,400	116,552	101,630
Sligo	461,796	146,229	171,606	180,866	128,510	124,645	116,493	111,578	94,416	84,022
MUNSTER.										
Clare	827,964	200,449	255,262	286,394	212,428	166,305	147,864	141,457	128,244	112,139
Cork	1,840,663	730,745	812,907	854,118	648,908	544,818	517,076	495,607	458,018	404,313
Kerry	1,195,363	210,185	241,559	268,887	226,236	201,800	190,560	186,392	178,136	160,831
Limerick	680,842	277,477	300,050	330,029	262,136	217,277	191,036	180,632	158,912	146,018
Tipperary	1,061,731	346,896	402,598	435,553	331,487	249,106	216,713	199,612	175,217	159,754
Waterford	461,552	156,521	176,398	196,187	164,061	134,252	123,810	112,768	95,702	87,080
	20,819,928	6,801,827	7,784,536	8,174,031	6,663,579	5,798,967	5,412,877	5,174,886	4,704,750	4,456,546

BRITAIN, New (called by the Germans New Pomerania), the largest of a group of islands situated

in the South Pacific Ocean, between the parallels of 4° and 6° 30' s. to the n. of New Guinea, and having Dam-

plies Strait to the w. and St. George's Channel to the e. The principal island, New Britain, is 350 miles long; area, 12,000 square miles. The other islands are New Ireland, New Hanover, and some smaller ones. They are a region of volcanic activity, whose evidences are most noticeable in the north-eastern part of the chief island known as the Gazelle Peninsula. The natives are Papuans, like those of New Guinea. The islands contain some high mountains, covered with lofty trees to their summits. The bread-fruit tree, the fig-tree, pepper, aloe, nutmeg, &c., are found here; and among the cultivated plants are taro, coco-nut palm, bananas, and sweet potatoes. Except in bats, the archipelago is very poor in mammals, but this is compensated by a rich avifauna, which, however, does not include birds of paradise. The natives are skilled in fishing. The seas abound in coral reefs, which often render the navigation dangerous. Dampier first discovered that this archipelago was separate from New Guinea. This group of islands is now in the possession of Germany, and has received the name of Bismarck Archipelago.

BRITANNIA. See **BRITAIN.**

BRITANNIA METAL, also called **WHITE METAL**, is an alloy that has come into very general use in modern times, many domestic utensils, such as spoons and teapots, being made of it. Such articles are commonly electro-plated, and made to resemble real silver. It consists chiefly of tin and antimony, but often contains also a small quantity of copper, zinc, and bismuth. A common proportion is 140 parts of tin, 8 of copper, and 9 of antimony; but the best alloy is composed of 90 parts of tin and 10 of antimony. The copper is used mainly to impart colour to the combination. The manufacture of the metal was introduced into England about 1770. *Queen's metal* is one of the varieties of Britannia metal. Birmingham and Sheffield are the chief British seats of its manufacture.

BRITANNIA TUBULAR BRIDGE. See **BRIDGE.**

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, a society first organized in 1831, mainly through the exertions of Sir David Brewster. Its first meeting was held at York, on 27th September, 1831, under the presidency of Earl Fitzwilliam. Its objects are thus described in the preamble to the rules of the association: 'To give a stronger impulse and a more systematic direction to scientific inquiry; to promote the intercourse of those who cultivate science in different parts of the British Empire with one another and with foreign philosophers; to obtain a more general attention to the objects of science and a removal of any disadvantages of a public kind which impede its progress'. This declaration is in exact conformity with the views of Sir David Brewster in founding the society. A similar institution had been established some years previously in Germany, namely in 1822. The second meeting of the British Association took place at Oxford in 1832, under the presidency of Dr. Buckland, and since then a meeting has been held every year up to the present time. All the principal towns of the United Kingdom have on one or more occasions formed the place of rendezvous, a different locality being chosen every year. In 1884 the meeting took place at Montreal, and in 1897 at Toronto. The sittings extend generally over about a week. The society is divided into sections, which, after the president's address, meet separately during the sittings for the reading of papers and conference. Soirees, conversations, lectures, and other general meetings are usually held each evening during the meeting of the Association. The sections are: A. Mathematics and Physics; B. Chemistry; C. Geology; D. Biology; E. Geography; F. Economic Science and Statistics;

G. Mechanical Science; H. Anthropology; I. Physiology; and K. Botany. Local committees are formed to arrange for meetings, &c. At first the British Association had to encounter a considerable amount of obloquy and ridicule as a body of dreaming and fantastic visionaries, whose deliberations could only end in smoke and tend to no practical result. A complete change soon came over the public mind in this respect, and the important national benefits conferred by the labours of various members of the Association have long been duly recognized and acknowledged. Among these may be mentioned more especially the experiments on electricity and magnetism which have achieved such important consequences in the establishment of the electric telegraph and a more thorough knowledge of the laws which govern the weather and other meteorological phenomena. In mechanical science also, as in the experiments on the relative strength of iron, which rendered such material service to Mr. Stephenson in the erection of the Britannia Tubular Bridge, the labours of members of the British Association have been productive of the most important results. As the funds which the Society collects at each meeting are more than sufficient to cover its expenses, it is enabled each year to make direct grants for the pursuit of particular scientific inquiries, which otherwise could not be conducted so efficiently, if at all; but besides this direct encouragement, its indirect influence on the promotion of science is undoubtedly great in many ways. In 1834 a grant of £20 was made for tide discussions; the highest amount of annual grants yet made was in 1868, namely, £1940. Among the presidents of the Association have been many distinguished men, including Dr. Whewell (1841), the Earl of Rosse (1843), Sir John Herschel (1845), Sir R. Murchison (1846), Sir David Brewster (1850), Sir George Airy (1851), Sir Richard Owen (1858), Prince Consort (1859), Lord Armstrong (1863), Sir Charles Lyell (1864), Sir J. D. Hooker (1868), T. H. Huxley (1870), Lord Kelvin (1871), J. Tyndall (1874), Sir John Lubbock (1881), Lord Rayleigh (1884), Lord Playfair (1885), Sir William Huggins (1891), Sir A. Geikie (1892), and Sir W. Crookes (1898).

BRITISH CHANNEL. See **ENGLISH CHANNEL.**
BRITISH COLUMBIA, a colony of Great Britain, established in 1858, and now forming with Vancouver's Island (which see) a province of the Dominion of Canada, is situated on the n.w. coast of America, between the forty-ninth and sixtieth parallels of n. lat. The boundaries are—w., the Pacific Ocean and the frontiers of the United States territory of Alaska; n., the parallel of 60°; e., the meridian of 120° w. from the northern boundary to Smoky River, and south of that the Rocky Mountains; s., the United States, which are separated from Columbia by the parallel of 49° n. lat. The water boundary-line between the colony and the United States, as settled by the arbitration of the Emperor of Germany in 1872, runs through the Haro Channel, between Vancouver's Island and San Juan, leaving the latter island, the possession of which was disputed, to the United States. Thus the colony has along the seaboard a length of 500 miles, and along its mountain frontier of 761 miles. Its breadth varies from 320 to 600 miles. Area about 383,000 square miles.

British Columbia is the most mountainous province of the Dominion and presents much grand and picturesque scenery. In Mt. Brown the Rocky Mountains attain the height of 16,000 feet. The Cascade or Coast Range runs parallel to the coast, and at a distance of 50 or 100 miles; between this range and the Rocky Mountains is an elevated valley, through which flows the Fraser River, the chief stream of the colony, receiving many affluents

from the w., n., and n.w., and entering the Gulf of Georgia in lat. 49° 14'. This gulf is formed by Vancouver's Island, which here extends in front of the continent; and thus absters the entrance to the Fraser River. About 16 miles above the mouth of the Fraser is the head of the delta formed by two branches, of which the more southern alone is practicable for ships. At this point, where the river is broad and deep, and the country becomes picturesque, stands New Westminster, at one time the capital. Vessels drawing 14 feet can ascend the river to a considerable distance above New Westminster. About 100 miles higher up the river eastwards is Hope, where the stream, hitherto flowing to the s., turns to the w. About 16 miles higher up, at Yale, the steamboat navigation ceases, owing to the numerous falls and the rapidity of the river. But a good road has been made to Lytton, a small town at the fork of the Fraser and Thomson rivers, about 250 miles from the sea. The Canadian Pacific Railway after reaching the Thomson follows the course of this river and then that of the Fraser almost to the mouth of the latter, the terminus being at the rising port and city of Vancouver. Numerous lakes, generally elongated from N. to S. between the several mountain ranges, aid with short portages to facilitate communication.

The climate of British Columbia is temperate and salubrious, and extremely favourable to vegetation. There is, however, a decided difference between the coast districts and the inland plateau, the extremes of temperature being much greater in the latter, and the rainfall very much less. Indeed, in parts, irrigation is essential to carry on agriculture. The forest timber attains a colossal magnitude. Fish are extremely abundant in all the streams and on the coasts. The country may be described at present as generally inaccessible, owing to the mountains, forests, and rapid rivers; but great advances have been made in the construction of roads in recent years. There are many fertile districts in the colony, among which may be mentioned in particular the delta of the Fraser River. Wheat, barley, oats, and other cereals ripen readily and give an excellent return, and the grass of the country is admirably adapted for fattening cattle, and agriculture and stock-raising are advancing. Fruit grows in perfection. The colony contains valuable mineral deposits the most important being gold and coal. The former was first found on the Fraser River in 1858, and since that time British Columbia has produced gold to the value of 9 or 10 millions sterling. The Cariboo diggings have been among the most productive. Coal is worked and exported, the chief mines being at Nanaimo in Vancouver's Island. Timber, fish, furs, and hides also form valuable articles of export, the 'canning' of salmon being now an industry of some importance.

The infant colony of British Columbia, taken in connection with that of Vancouver's Island, seems to possess every condition of great future prosperity. Now that it has been united with the eastern colonies by the Canadian Pacific Railway, its vast resources will no doubt be properly developed, and it will probably become one of the richest countries in the world. British Columbia and Vancouver's Island were formerly distinct governments, but both now form one province, and were united to the Dominion of Canada in 1871. The capital is Victoria on Vancouver's Island. The population in 1881 was stated to be about 60,000, including Indians and Chinese; in 1891, 98,173; in 1901, 177,272.

BRITISH MUSEUM, the great national museum in London, owes its foundation to Sir Hans Sloane, who, in 1753, bequeathed his various collec-

tions, including 50,000 books and MSS., to the nation, on the condition of £20,000—less by £30,000 than the original cost—being paid to his heirs. This offer was agreed to by Parliament, which authorized a lottery of £100,000 to implement the bargain, as well as to purchase other collections. Montagu House, which was bought for the purpose for £10,250, was appropriated for the museum, which was first opened on the 15th of January, 1759. The original edifice having become inadequate, a new building was resolved upon in 1823, the architect being Sir R. Smirke, whose building was not completed till 1847. It forms a hollow square, facing the cardinal points of the compass. The southern, or Russell Street front, is the principal one, having an imposing columnar façade of the Ionic order. This, as well as the other three, looks into the central square court, which measures about 320 feet by 240. There are two stories of galleries and rooms round the greater part of the building. Smirke's designs were no sooner completed than it was found that additional accommodation was needed in various departments, and several new rooms were provided; but the library accommodation being wholly inadequate for the accommodation of the readers, as well as for the reception of new books, a grant was obtained from Parliament for a new library building in 1854, and it was completed and opened in 1857, at a cost of £150,000. It was erected in the interior quadrangle, and contains a circular reading-room 140 feet in diameter, with a dome 106 feet in height. The whole arrangements have been completed with the utmost economy in regard to space, and besides ample accommodation for books, the reading-room now contains accommodation for 800 readers comfortably seated at separate desks, which are provided with all necessary conveniences. The plan was prepared by Mr. Panizzi, the late chief librarian, who superintended its execution. More recently, the accommodation having become again inadequate, it was resolved to separate the objects belonging to the natural history department from the rest, and to lodge them in a building by themselves. Accordingly a large natural history museum has been erected at South Kensington, and the specimens pertaining to natural history (including geology and mineralogy) have been transferred thither, but they still form part of the British Museum. Externally this building is somewhat heavy in character, but the interior has been treated in a most artistic manner. The British Museum is under the management of 48 trustees, among the chief being the Archbishop of Canterbury, the Lord-Chancellor, and the Speaker of the House of Commons. In all the staff of the institution numbers over 320 persons. The museum is open daily, free of charge. Admission to the reading-room as a regular reader is by ticket, procurable on application to the chief librarian, there being certain simple conditions attached. We have not space to attempt any description of the treasures of this noble institution. We may mention, however, that at present it contains something like 2,000,000 volumes in the department of printed books. A copy of every book, pamphlet, newspaper, piece of music, &c., published anywhere in British territory, must be conveyed free of charge to the British Museum. There are various catalogues and handbooks prepared by the officers of the museum, and containing classified descriptions of the contents of the different departments. The museum contains eight principal departments, namely, the department of printed books, maps, charts, plans, &c.; the department of manuscripts; the department of natural history; the department of oriental antiquities; the department of Greek and Roman antiquities; the

department of coins and medals; the department of British and mediæval antiquities and ethnography; and the department of prints and drawings.

BRITISH NORTH AMERICA comprises the Dominion of Canada and the island of Newfoundland, with the portion of Labrador belonging to the latter. The Bermudas may also be included.

BRITTANY, or **BRITTAGNE**, formerly one of the largest provinces of France, being a peninsula washed by the Atlantic on all sides except the E., where it joined Poitou, Anjou, Maine, and Normandy. It now forms five departments, Finistère, Côtes du Nord, Morbihan, Ille et Vilaine, Loire Inférieure, containing, in 1896, 3,175,961 inhabitants on 13,180 square miles. It is supposed to have received its name from those Britons who were expelled from England and took refuge here at various periods between the fifth and the seventh century. Before that time it bore the name of Armorica. It formed one of the duchies of France, and was held by sovereigns nearly independent and often at war with the French monarchs till it was united to the crown by the marriage of Louis XII. with Anne of Brittany, the widow of Charles VIII., in 1499. It was given by Louis XII. to Claude, countess of Angoulême, who married Francis I., and was reunited to the crown in 1532. The province was divided into Upper and Lower Brittany. Agriculture in this territory is very backward, and it is estimated that about one-half of the surface lies waste. Corn and wine are produced in small quantities. Flax and hemp, apples and pears, are abundant and of good quality. Cider is the principal drink. Salt is made on the coast, and coals, lead, and iron are found in various parts. There are manufactures of hemp, flax, and iron. The fisheries also employ many of the inhabitants. The people of Brittany still retain their ancient language, which is closely allied to Welsh, and is exclusively used by the peasantry in the western part of the province. Many Celtic remains are found throughout the country.

BRITTON, JOHN, a celebrated writer on architectural antiquities, was born on July 7th, 1771, at Kingston St. Michael, near Chippenham, Wiltshire, where his father was a general dealer and small farmer. In 1787 he came to London, and was employed for six years as cellarman in the Jerusalem Tavern, Clerkenwell, and afterwards served in the same capacity in the London Tavern. He next entered the employment of a hop merchant in Southwark, and then an attorney's office in Gray's Inn. During all this period he had sedulously cultivated his taste for reading during his leisure hours, and took part in the proceedings of several debating societies. In 1799 he accepted an engagement from a Mr. Chapman to write, sing, and recite for him at a theatre in Pantion Street, Haymarket, at a salary of three guineas per week. From this period his literary career may be said to have commenced, developing itself at first in the form of pamphlets, song-books, and similar minor subjects. He soon advanced, however, to a higher grade, and in 1801 appeared the first two volumes of the *Beauties of Wiltshire*, by J. Britton and E. W. Brayley. These collaborators, with others, subsequently completed a similar work for all the other counties of England (London, 1801-16, eighteen vols.: 1825, twenty-six vols., &c.). In 1805-14 Mr. Britton published his *Architectural Antiquities of Great Britain* in four 4to volumes, supplemented in 1818-26 by a volume entitled *Chronological History and Graphic Illustrations of Christian Architecture in England*. These were followed by his *Cathedral Antiquities*, in fourteen volumes, commenced in 1814 and completed in 1835, and the *Dictionary of the Architecture and*

Archæology of the Middle Ages, 1832-38. He reached the advanced age of eighty-six, and died in London on 1st January, 1857.

BRIVES, or **BRIVE LA GAILLARDE** (ancient *Briva Curvetia*), a town in France, department of Corrèze, agreeably situated amidst vineyards and orchards, on left bank of the Corrèze, surrounded by a fine avenue of elms. The houses are substantially built of stone, but the streets are narrow, and the public squares indifferent. It contains a church of St. Martin dating from the twelfth century, some old houses in the Gothic style, and a library. Manufactures—leather, cotton goods, pottery, &c. Slates are worked in the neighbourhood. Pop. (1896), 18,111.

BRIXHAM, a market town and seaport of England, in Devonshire, is prettily situated on the English Channel, occupying the sides of two hills, a little S. from Berry Head, the S. point of Torbay, and 23 miles S. of Exeter. Most of the older houses are very indifferent buildings, but some of those of more recent erection are sufficiently respectable. The parish church is a large ancient structure, in the perpendicular style. The trade of Brixham is chiefly in fish, and is of considerable extent, London, Bath, and Bristol receiving supplies from this place. The port possesses also a number of vessels engaged in the coasting and foreign trade; those in the latter plying chiefly to the Mediterranean. Ship-building and the manufacture of sails, ropes, paint, &c., are among the other industries. Brixham is celebrated in history as the place where the Prince of Orange, afterwards William III., landed, Nov. 4, 1688. In 1858 a cave was discovered on Windmill Hill, containing the bones of extinct mammals, some flint implements, &c. Pop. (1891), 6224; (1901), 8090.

BROACH, or **BABOACH**, a seaport town in Gujarat, Bombay, Hindustan, on the Nerbudda, about 80 miles from its mouth. The river here is crossed by a railway bridge, and for about a mile in front of the town is lined with a massive stone wall. Broach is surrounded with ruinous walls, and has narrow streets, with houses mostly of two stories and built of brick. There are no buildings of interest. It is an ancient place, and one of the oldest seaports of Western India, and was formerly famous for its cotton manufactures. The town was taken by storm by the British in 1772, and with the district, ceded to them by treaty with Scindiah in 1803. Formerly it had a great export of cotton, and it still carries on a trade in cotton, grain, and seeds with Bombay and Surat. Pop. (1891), 40,168 (including many Parsees). The district of Broach lies on the east side of the Gulf of Cambay. Broach cotton holds the highest place in the Bombay market. Area, 1453 square miles; pop. (1891), 341,490.

BROACH-TO, in nautical language, to incline suddenly to windward of the ship's course when she sails with a large wind; or, when she sails directly before the wind, to deviate from her line of course with such rapidity as to bring her side to windward, and expose her to the danger of oversetting.

BROAD ARROW is a British government mark resembling an arrowhead placed on naval stores to distinguish them as public or crown property, and also used otherwise. The origin of the mark, as well as of its present use, is doubtful. The use of the broad arrow as a mark by private persons is prohibited under a penalty.

BROAD PIECE, a denomination that has been given to some English gold pieces broader than a guinea, particularly Caroluses and Jacobuses.

BROADSIDE, in a naval engagement, the whole discharge of the artillery on one side of a ship of war, above and below. The fighting power of a ship was formerly estimated by the weight of her broadside.

BROADSTAIRS, a watering-place in the Isle of Thanet, Kent, 2 miles north-east of Ramsgate. It is said that the name is derived from the width of the passage leading down to the sea. There is a church of the Holy Trinity in Early English style, built in 1840. Pop. (1891), 5234; (1901), 6460.

BROADSWORD, a sword with a broad blade, designed chiefly for cutting, formerly used by some regiments of cavalry and Highland infantry in the British service. The claymore or broadsword was formerly the national weapon of the Highlanders.

BROADWOOD, JOHN, pianoforte manufacturer, was born at Cockburnspath, Dunbar, in 1782. Going to London, he entered into partnership with a Swiss maker of harpsichords, named Burkhardt Tschudi, the firm being known as Tschudi and Broadwood. In 1769 his partner retired, and on his death four years later his son became a partner with Broadwood; but from 1783 till 1795, when Broadwood's son entered into partnership with him, he had the sole control of the business. The firm has long been known as John Broadwood & Sons. By the skill of Broadwood and those associated with him many improvements were introduced in the construction of the pianoforte, and for a long time the history of the firm was practically the story of the progressive development of that instrument. John Broadwood died in 1812.

BROCA, PIERRE PAUL, French surgeon and anthropologist, was born at Sainte-Foy-la-Grande, in the department of the Gironde, on June 28th, 1824, and died at Paris on July 9th, 1880. In 1841 he began the study of medicine at Paris, became hospital surgeon in 1844, anatomical assistant in the Faculty of Medicine in 1846, and preparator in anatomy in 1848. In 1867 he became professor in the faculty, by which time he had already made himself known as a brilliant investigator. Between 1861 and 1865 he carried out his famous researches on the localization of cerebral functions. Broca also gained great distinction in anthropology, and in 1859 he founded the Paris Anthropological Society. During the Franco-German war he was chiefly engaged in hospital work at La Pitié, but when peace had been concluded he resumed his teaching. In 1872 he founded the *Revue d'Anthropologie*, and four years later he established the *École d'Anthropologie*, which formed the nucleus of the later Institut Anthropologique. His writings are very numerous and important.

BROCADE, a fabric having a pattern of raised figures; often a stuff of silk, enriched with a raised pattern of flowers, foliage, and other ornaments. Formerly it signified a stuff woven all of gold or silver threads, or in which silk was mixed with such threads; at present all stuffs are so called if they are worked with raised flowers or other figures, and especially when the figures are in more than one colour.

BROCCOLI, a late variety of the cauliflower (*Brassica oleracea botrytis*), hardier and with more colour in the flower and leaves. The chief varieties are green, purple, and dwarf broccoli. Broccoli is inferior in flavour to cauliflower, but serves as a substitute for it when the latter cannot be obtained.

BROOK, SIR ISAAC, major-general, was born in Guernsey on Oct. 26th, 1769. Educated at Southampton and Rotterdam, he entered the army as ensign in the 8th regiment in 1785. In 1791 he transferred himself to the 49th foot, and saw service in the West Indies. In 1802 he went to Canada at the head of that regiment, returning three years afterwards; but in 1806 he was again in North America. He became major-general in 1811, and in the following year he compelled the surrender of General Hall of

the United States at Detroit. For this service he received a knighthood of the Bath, but he did not live long to enjoy the honour; for during an attack on Queenstown by another American force on Oct. 13th, 1812, only three days after he was knighted, he was mortally wounded. A sum of £1575 was voted by the House of Commons for a monument to Brock, which now stands in the south transept of St. Paul's, London. There is another monument to him at Queenstown, erected at public cost in 1842.

BROCKEN, a famous mountain in Germany, popularly known as Blocksberg, the highest summit of the Harz mountains, in the Prussian government of Magdeburg. The bare, treeless summit is covered with snow from November to June; and on it are a hotel and an observatory. Here under certain atmospheric conditions the visitor may see a gigantic figure of himself reflected on the clouds ('the spectre of the Brocken'); and here on Walpurgis Night the German witches used to assemble for an annual orgy. Two driving roads lead up the mountain, and a railway is being constructed. Many tourists visit the Brocken during the summer, and in clear weather an extensive view is obtained. Its height is about 3745 feet.

BROCKVILLE, a town of Canada, in the province of Ontario, on the left bank of the St. Lawrence, about 40 miles below Kingston and 160 above Montreal. It is a station on the Grand Trunk Railway, and is a well-built attractive place with numerous trees planted in the streets. It has considerable hardware and other manufactures, as steam-engines, chemicals, agricultural implements, &c. Pop. (1891), 5791; (1901), 8940.

BRODERIP, WILLIAM JOHN, naturalist, was born in Bristol on Nov. 21st, 1789, and graduated B.A. from Oriol College, Oxford, in 1812. He studied law, and was called to the bar in 1817, and subsequently occupied several legal posts. In 1851 he became treasurer of Gray's Inn, with which office was combined that of librarian. He was an enthusiastic naturalist, and made many fine collections, his conchological cabinet being purchased for the British Museum. In 1847 he published *Zoological Recreations*, and five years later appeared *Leaves from the Note Book of a Naturalist*. He died in London on Feb. 27th, 1859.

BRODIE, SIR BENJAMIN COLLINS, BART., an eminent surgeon, born 9th June, 1783; died at Broms Park, Surrey, 21st October, 1862. He was a younger son of the Rev. P. B. Brodie, rector of Winterslow, near Salisbury, where he was born. His father superintended his education till he was sixteen, when he was sent to the Hunterian School of Anatomy in Great Windmill Street. In 1803 he became a pupil of Sir Everard Home, at St. George's Hospital. He passed his examinations and became a member of the college in 1805, at which time he was appointed assistant to Mr. Wilson, the demonstrator of anatomy. In 1809 he became a lecturer of the school and assistant surgeon of the hospital. In 1810 he was elected Croonian lecturer to the Royal Society, and chose for his subject, *The Influence of the Brain on the Action of the Heart and the Generation of Heat*. During the same year he laid before the society various papers, among which was one On the Effects of certain Vegetable Poisons, the excellence of which caused him to be elected a fellow, and in the following year he received the Copley medal. His reputation as a distinguished surgeon was now established, and his professional career became one of uniform success. From 1819 to 1823 he was professor of anatomy at the Royal College of Surgeons. In 1822 he was elected a full surgeon at St. George's. He continued giving clinical lectures there

till 1830, when the increasing demands of his profession compelled him to discontinue them. In 1832 he succeeded Sir Everard Home as sergeant-surgeon to William IV., and was made a baronet by patent in 1834. Her Majesty Queen Victoria continued him in the same appointment. From 1835 to 1846 he was a member of the Court of Examiners of the College of Surgeons, and in 1844 he was president of the court. In 1858 he was elected president of the Royal Society, which honour he held till 1861. For some years before his death his sight had been failing, and for about two years he was almost totally blind. As a professional practitioner his gains exceeded those of almost any man of like profession in his time. His earlier essays gained him a high reputation as an accurate observer and sound physiologist. In 1851 he republished a selection of them, entitled *Physiological Researches*. As a surgeon he had few equals, and his work on *Pathological and Surgical Observations on Diseases of the Joints*, 1818, was esteemed of great value both in Great Britain and on the Continent. It went through many editions, successively enriched by the additional experience of the author. In 1854 he published a work in a colloquial form entitled *Psychological Inquiries*. The dialogue is not controversial, and the work contains the mature opinions of the author on various speculative subjects. He was married and left two sons.—His elder son, SIR BENJAMIN COLLINS BRODIE, born in London in 1817, and educated at Harrow and Balliol College, Oxford, gained some distinction as a chemical investigator. In 1855 he became professor of chemistry at Oxford, and in 1880 he died.

BRODY, a town in Austrian Galicia, situated near the Russian frontier, 58 miles E.S.E. of Lemberg, on a swampy plain. It has broad streets, houses mostly built of stone, an old castle, three churches, Jewish synagogue, &c. About two-thirds of its inhabitants are Jews, who have a hospital for themselves, and a college for the instruction of artists and mechanics. The commerce, carried on principally by Jews, is important, the town being very favourably situated for the interchange of goods between Austria and Russia, and for the exchange of the products of Poland for the horses, cattle, wax, honey, tallow, skins, furs, preserved fruits, &c. of Walachia, Turkey, the South of Russia, &c. Pop. (1890), 17,534.

BROGLIE, a family distinguished in the annals of French wars and diplomacy, which derives its origin from Piedmont.—1. **FRANÇOIS MARIE, DUC DE**, marshal of France, born in 1671; died in 1745; from 1689 fought with distinction in the Netherlands, in Germany, and Italy. He was also employed in diplomatic affairs, and concluded a treaty between France, England, and Prussia in 1725. He rose by degrees, till, in 1734, he became marshal of France. In the Austrian War of Succession he had the chief command of the armies in Bavaria and Bohemia.—2. **VICTOR FRANÇOIS, DUC DE**, eldest son of preceding, likewise marshal of France, born in 1718; died 1804; commenced his career under his father in the battles of Guastalla and Parma (1734); was engaged in all the wars of France, and was created marshal in 1759. Jomini considered him as the only French general who had shown constant ability during the Seven Years' war. He was engaged in the battles of Hastenbeck, Rossbach, Sondershausen, and Lützenberg, and being appointed to the chief command, defeated the Prussians and Hessians at Bergen in 1759, for which Francis I. of Austria created him a prince of the empire. In 1760 he gained another victory at Corbach, but was defeated, together with the Prince of Soubise, at Willinghausen, in the following year. In consequence of this and the favour of Soubise at court he was

exiled. He was recalled in 1764, and in 1789, when the revolution broke out, Louis XVI. appointed him minister of war; at the same time he received the command of the troops that were to keep Paris in check. The desertion of the National Guards rendered all his efforts vain, and Broglie left France. In the campaign of 1792 he commanded a division of the *émigrés* without success. After its close he withdrew entirely from public life, and died at Munster in the eighty-sixth year of his age.—3. **VICTOR CLAUDE, Prince de Broglie**, born in 1757, guillotined 27th June, 1794, was the third son of Victor François. He entered at first into the views of the revolutionary party. He was deputy of the nobility of Colmar to the states-general in 1789. After the dissolution of the constituent assembly he was appointed field-marshal in the army of the Rhine, but upon his refusal to acknowledge the decree of the 10th of August suspending the royal authority was deprived of his command, and afterwards summoned before the revolutionary tribunal, and led to the guillotine.

—4. **ANTHONY CHARLES LEONCE VICTOR, DUC DE**, son of Victor Claude, born 1785, died 1870. In 1816 he married a daughter of Madame de Staël and was made a member of the chamber of peers. After the revolution of 1830 the Duc de Broglie and Guizot were the heads of the party known as *doctrinaires*. He was minister of public instruction for a short time in 1830, and minister of foreign affairs from Oct. 1832 to April, 1834. In 1849 he was a conservative member of the Legislative Assembly, and after the coup d'état he continued a bitter enemy of the imperial régime. His later years were devoted to philosophical and literary pursuits.—5. **JACQUES VICTOR ALBERT, DUC DE**, son of the preceding, was born on June 13th, 1821. In 1846 he became secretary to the embassy at Madrid, whence he was transferred to that at Rome, but the revolution of 1848 caused him to give up public life. From that time he became known as an able writer in political reviews. In 1856 he published *L'Histoire de l'Eglise et de l'Empire*, in six volumes, a work which gained him a chair in the Academy. In 1871 he was elected to the National Assembly for the department of Eure, and in the same year became ambassador at London. He led the opposition to Thiers during 1872-73, and finally succeeded in defeating him. In the latter year he became minister of foreign affairs and president of the council, but in 1874 he suffered defeat. In 1885 he again gave up political life and devoted himself to his historical studies. Among his works are *Le Secret du Roi Louis XV.* (1878); *Frédéric II. et Marie-Thérèse* (1883); *Maurice de Saxe et le Marquis d'Argenson* (1891); *La Paix d'Aix-la-Chapelle* (1892); *Le Père Lacordaire* (1895); *Malherbe* (1897); &c.

BROKE, SIR PHILIP BOWEN VERN, British admiral, was born at Broke Hall, Ipswich, 9th Sept. 1776; died 2nd Jan. 1841. He entered the navy in 1792, and after he had seen much active service, distinguished himself, particularly in 1813, as commander of the frigate *Shannon*, in the memorable action which that vessel, in answer to a regular challenge, fought with the *Chesapeake* off the American coast. The *Shannon*, carrying thirty-eight guns and 330 men, in an engagement of only fifteen minutes, boarded and captured the *Chesapeake*, carrying forty-nine guns and 440 men. Sir Philip, who was severely wounded in the action, was immediately made a baronet, and in 1815 K.C.B. He became rear-admiral in 1830.

BROKER, an agent who is employed to conclude bargains or transact business for others in consideration of a charge or compensation, which is usually in proportion to the extent or value of the transaction

completed by him, and is called brokerage. The broker in English law is considered a middleman, or intermediate negotiator between the principals on both sides of the negotiations conducted by him. Primarily he is the agent of one party, who originally employs him, but as it is his business to receive and represent to his principal, if need be, the proposals of the other party, he comes under a twofold obligation, and good faith is required in his dealings with both, or, if there should be a plurality of negotiators, with all. The use of brokers indicates a considerable advance in mercantile organization, and implies extensive and complicated mercantile relations in the community where it prevails. In the natural order of development it would probably come after the establishment of a regular currency. In a community where the merchants or negotiators were few there would be little need for a broker, and his fees would hardly suffice for his subsistence; but a broker who was only occasionally employed would very imperfectly represent the principle of brokerage, which requires that the agent should be exclusively set apart for agency business. In large mercantile communities not only are brokers regularly employed, but the business of a broker is limited to a particular class of transactions, with which he is expected to be specially conversant; and brokerage forms not a single trade, but a complete class of trades with a systematic subdivision. The use of a broker in mercantile transactions rests upon two main positions. A merchant may deal in a number of different commodities, with all of which and with the parties who buy or sell them he cannot be so specifically acquainted as to be able to conduct his whole business satisfactorily with principals; but in each transaction he can find a broker whose business it is to have the exact knowledge required for his purpose, and whose knowledge and practical experience he may have the use of for a fee. But even when the principal knows exactly with whom he is going to deal, and has sufficient experience to deal for himself, there are often advantages in carrying on negotiations through a third party. Experience shows that there are many different kinds of influence and pressure brought to bear in the conduct of mercantile transactions, and there is almost always some kind or other of such extraneous influences which a man who is acting for himself finds it difficult to resist. A merchant, for example, may be doubtful of the credit of a proposed customer, and yet be very unwilling to tell him so. In all such cases a broker who can refer all difficulties and refusals to an unknown principal has an advantage which is well worth purchasing by a moderate fee. In markets where the business of brokerage is well understood the services of a broker are regularly resorted to for this reason alone, even when they might be otherwise dispensed with, and the broker consequently obtains a standing, and acquires immunities, which enable him to conduct his business with a freedom and success which would otherwise be impossible. This is well illustrated by the different treatment which the broker receives in a small or imperfectly educated mercantile community. If a broker in such a community is employed for his specific knowledge, say of a particular class of buyers, he takes great pains to conceal this knowledge from his employer, who would otherwise on the next occasion go straight to the principals. In a large market the broker attempts no such concealment, and he is protected not only by the intrinsic value of his services, but by the habits of the market, which would attach open disgrace to the attempt to use the information of a middleman to his disadvantage. Brokers have legal privileges, covering the right of remuneration for their services, but these are founded on and

derive their efficacy from the mercantile usages of each community. In a mercantile community there are nearly as many species of brokers as there are different departments of trade, but there are a few which from their particular privileges or importance it may be of advantage to enumerate.

BILL-BROKERS, EXCHANGE-BROKERS. See **BILL OF EXCHANGE.**

INSURANCE-BROKER is the middleman who negotiates between underwriters and the owners of vessels and shippers of goods whose property he insures. (See **UNDERWRITER**.) An insurance-broker has a set of underwriters, who are his principals, and a constituency of owners and merchants, who are his customers, and who send him orders to insure for them. He meets with other brokers to settle the terms on which risks will be taken, and when he has a risk to cover for one of his customers he may perhaps put down his own underwriters for a portion of it, and give a portion of it to other brokers to be covered by their underwriters. In this way the risks are divided, and each underwriter has a large number of small risks instead of a few great ones. The transactions of the broker are subject to the approval of the underwriters, who must sign the contract as principals; but he usually receives general instructions to act for them in a particular way, and as long as he conforms to his instructions they sign as a matter of course. This understanding enables him to carry on his business systematically with his customers. He is paid by a percentage of the premiums. When a merchant insures goods through a broker the premium or price of the insurance may not be immediately paid; but if there is an established period of credit the insurance, notwithstanding this, is valid, and the policy, or stamped engagement signed by the underwriters, lies with the broker in trust for the insurer as a lien for payment of the premium. If the broker gives any credit to the insurer beyond the established custom he is himself liable to his principal for the payment of the premium, and it becomes a point of great legal nicety whether the policy is violated or not. The business of an insurance-broker is quite different from that either of an authorized agent, or of a sub-agent or canvasser of an insurance company. Marine insurance is now largely carried on by companies, and the merchant who deals with the agent of a company deals to all intents not with a broker but with a principal.

PAWNBROKER, though called a broker, is really a principal. See **PAWNBROKER.**

PRODUCE-BROKERS and others who sell by auction act by license, and are sometimes sworn.

SHIP-BROKER is the agent of owners of vessels in chartering them to merchants or procuring freights for them from one port to another. Like the insurance-broker he usually acts upon general instructions, but his business is governed entirely by the common principles of brokerage.

STOCK-BROKER is the agent of dealers in shares of joint-stock companies, government securities, and other monetary investments. On account of the great responsibilities incurred by these brokers they are usually placed under some restrictions or special regulations, either by legal enactment or mercantile custom. In France the stock-brokers (*agents de change*) are sworn in. They are allowed from one-eighth to one-fourth per cent. brokerage on each transaction. The number is limited for each town according to its size. The number for Paris is sixty, each of whom gives security for 125,000 francs (£5000). The position of a stock-broker in Paris or other large towns of France has thus become a property transmissible by purchase, and can only be acquired by a large capitalist. In America the trade

of stock-broker is unrestricted. In England stock-brokers are subject to certain general legal restrictions, as that by which contracts in the form of wagers are rendered void, and the sale of stock in the public funds is limited to licensed brokers, but in general the trade is only restricted by the regulations of the brokers' associations in each town, which are more or less modelled upon the rules of the London Stock-exchange, with which all other associations of brokers have necessarily, though indirectly, the most intimate business connections. The London Stock-exchange is partly a proprietary association. It is governed by a committee elected by the members, to whom all disputes are referred. The committee fixes the modes of doing business and the time and conditions of settlements. An applicant for admission must obtain the security of three members for a period of two years to the extent of £500 each. No applicant is admitted who is engaged in other business. Partnerships with non-members, or between brokers and dealers, are prohibited; and all partnerships among members must be intimated to the committee and posted in the exchange. A member declared to be a defaulter ceases to be a member of the stock-exchange. See STOCK-EXCHANGE.

BROMBERG, a town of Prussia in the Province of Posen, and 69 miles N.E. of the city of that name, is situated on the Brahe, 6 miles W. of its confluence with the Vistula. It is well built, has two Protestant and two R. Catholic churches, a synagogue, asylum for the blind, a gymnasium, and a real-gymnasium, a normal seminary for Protestant teachers, &c. Among its industries are iron-founding and machine-making, brewing, distilling, paper-making, tanning, flour-milling; and there is a flourishing trade, greatly fostered by the Bromberg Canal, which connects the Oder with the Vistula. Bromberg was at one time a Polish town, and for a short time under Napoleon it was restored to the Poles. Pop. (1895), 46,417.

BROME, RICHARD, dramatist, died about 1652. He was at first the servant and afterwards the friend of Ben Jonson, who encouraged him in his literary work, and on whose style his plays are modelled. The best and most popular of his dramas, some of them comedies dealing with the everyday life of his time and others of a more romantic character are: *The Court Beggar* (acted 1632); *The Love sick Court* (published 1659); *The Queen and Concubine* (published 1659); *The Northern Lass* (printed 1632); *The Sparagus Garden* (acted 1635); *The Antipodes* (acted 1638), and *A Jovial Crew* (acted 1641). Some of his plays are entirely in prose, whilst others are written, in whole or in part, in indifferent verse.

BROMELIACEÆ, a natural order of endogenous monocotyledonous plants inhabiting the tropical regions. The type of the order is the genus *Bromelia*. The leaves are alternate, elongated, narrow, toothed and spinous on the margins. The calyx is formed of six sepals, the three exterior ones shorter and less coloured, the interior ones longer and petaloid in form. The stamens are usually six, but sometimes fewer, inserted in the internal face of the sepals. The style is simple, sometimes divided into three segments at its summit, and terminated by three stigmata. The fruit is capsular or succulent, and many-seeded. They grow in the rich vegetable soil of forests, or upon the branches of trees, round which they twist their roots, without being parasitical; they are consequently called air-plants. They frequently grow for months suspended in the air, after being severed from their roots. Their flowers are white, crimson, blue, or purple, and are very handsome. The fruit of the genus *Ananas* is the well-known pine-apple. The leaves are hard, and

VOL. II.

are so contrived as to be able to hold water at the base. They are natives of the W. Indies and other tropical regions of America, but are naturalised in Asia and Africa. Their fibres are valuable for a variety of purposes.

BROMINE (Greek *brōmos*, a bad smell), an element (atomic weight 79.75) discovered by Balard in 1826, and so named in consequence of its disagreeable odour. It is not found free in nature, but obtained from the bittern of sea-water, the washings of the ashes of sea-weed, and from the salt mines of Stassfurt. It is very widely distributed, but is not abundant. It is a dark-red liquid, which gives off a red vapour at the ordinary temperature of the air; the specific gravity of the liquid is 3.19, and of the vapour (compared with air) 5.5. The liquid solidifies at 19°, and boils at 138° Fahr. It dissolves abundantly in ether, less readily in alcohol, and less still in water. The aqueous solution has a reddish-yellow colour, and the strong suffocating odour of bromine, and it bleaches, though not so readily as chlorine water. Bromine is absorbed by alkalies, forming a bromide and bromate. It combines with oxygen and hydrogen to form hypobromous, bromic, perbromic, and hydrobromic acids. Analogous to the corresponding compounds of chlorine, ordinary combustibles do not burn in bromine vapour, but some of the metals, when finely divided, catch fire in it, and phosphorus combines with it with great violence. Bromine acts as a caustic and local irritant. Small doses act very powerfully on the alimentary canal. It seems to resemble iodine in its therapeutic properties. Bromide of potassium is also used in medicine, and the bromides of cadmium, silver, and ammonium are employed in photography.

BROMLEY, a town of England, county Kent, 10 miles S.E. of London. It has a market square with a large market-house, and has rapidly increased by the erection of large groups of houses occupied by London merchants in its vicinity. The most notable place of worship is the modern church of St. Peter and St. Paul, which is of various styles. There is an important charitable foundation—Bromley College—which provides residences and £38 a year for forty widows and daughters of clergymen. Pop. in 1871, 10,674; in 1891, 21,684; in 1901, 27,358.

BROMPTON, the name of several places in England, especially a suburban district of London, in Kensington, associated with the names of Burke, Canning, and other eminent men. At West Brompton there is a large hospital for consumptives, and here also is a Roman Catholic oratory with a fine church in the Renaissance style.

BROMSGROVE, a market town of England, in the county of Worcester. It is pleasantly situated on a plain, 12 miles N.E. of Worcester, and 13 miles S.W. of Birmingham, on the left bank of the Salwarp, and consists of two principal streets, and several others diverging. The houses are in general well built, and mostly of brick, intermingled with a few ancient wood-framed edifices, some of them dating back to 1671. In the centre of the town is the town-hall, a neat and commodious, though unpretending building. The grammar-school was founded in 1553, and there is also the College School dating from 1857. The parish church, on an eminence at the western side of the town, is an ancient and handsome structure, in the Early English and Perpendicular styles, with a tower 189 feet high. Nail-making is the chief industry; there are also shoe factories and other works. Pop. (1881), 7959; (1891), 7934; (1901), 8416.

BRONCHITIS, an inflammation of the mucous membrane of the bronchial tubes, that is the air-passages leading from the trachea (windpipe) to the lungs. It is of common occurrence, and may be either

acute or chronic, being produced mostly by exposure to cold, the inhaling of irritating substances, or as a result of fevers and similar affections. Its symptoms are those of a feverish cold, such as headache, lassitude, and an occasional cough, which are succeeded by a more frequent cough, occurring in paroxysms, and a feeling of great oppression on the chest. Slight attacks of acute bronchitis are frequent and not very dangerous. They may be treated with counter-irritants, such as mustard poultices or fomentations of hot turpentine. Aperients and medicines to promote perspiration and expectoration are also given, but the latter should be used with discrimination. The patient should be kept in a moderately warm room, the air of which is kept moist by the steam from a kettle. In the severer form, acute bronchitis is a formidable malady, and requires prompt treatment. Confirmed chronic bronchitis is mostly confined to persons in middle and advanced life, and often exists along with gout or diseases of the heart or kidneys. Those suffering from it feel its effects most in winter, especially in damp or foggy weather. As it develops the shoulders become much rounded and the chest barrel-shaped; sometimes, too, the discharge from the mouth has a bad smell. Exposure to inclement weather or to considerable changes of temperature must be avoided; the diet should be good and moderate; tonics should be taken, and during aggravated attacks the chest should be poulticed as in the acute variety. Cod-liver oil is also useful.

BRONCHOCELE. See **GOITRE**.

BRONCHOTOMY, in surgery, an incision into the windpipe or larynx between the rings to afford a passage for the air into and out of the lungs when any disease prevents respiration in the usual way, or to extract foreign bodies which have got into the trachea, or in cases of suffocation, drowning, &c. It is known as *tracheotomy* or *laryngotomy*, according as the windpipe or the larynx is operated on.

BRONGNIART, ALEXANDRE, a celebrated chemist and mineralogist, was born at Paris in 1770; died at Paris in 1847. He turned his attention at a very early age to the study of the ceramic art; and after having served for some time in the army on the medical staff, was appointed, in 1800, director of the porcelain manufactory at Sèvres, where he revived the art of painting on glass. In 1807 appeared his *Traité Élémentaire de Minéralogie*; and about the same time his labours in the department of natural history brought him into contact with Cuvier, whom he aided materially in classifying the newly-discovered fossils of Montmartre. Along with Cuvier he engaged in the composition of the *Essai sur la Géographie Minéralogique des Environs de Paris*, which was first published in 1811, and afterwards appeared in 1822, much enlarged, under the title of *Description Géologique des Environs de Paris*. In 1844 appeared his *Traité des Arts Céramiques*. He succeeded Haüy as professor of mineralogy in the Museum of Natural History in 1822.

BRONTË, a town of Sicily, 22 miles N.W. of Catania, in a picturesque situation at the base of Mount Etna. It has manufactures of woollen cloth and paper, and some trade in wine, oil, silk, grain, almonds, &c., produced in the neighbouring district. Lord Nelson was created Duke of Brontë by the Neapolitan government in 1799. Pop. (1881), 16,577.

BRONTË, CHARLOTTE (afterwards **Mrs. NICHOLLS**), the eldest of three famous sisters, was born at Thornton, in Yorkshire, 21st April, 1816; died at Haworth, 31st March, 1855. She was the third daughter of the Rev. Patrick Brontë, a native of Ireland, who changed his original name Prunty to Brontë, and at the time of her birth was rector of Thornton. From

thence he removed in 1820, on becoming incumbent of Haworth, a moorland village in the West Riding of Yorkshire, about 4 miles from Keighley. Her mother died soon after this removal, and her father, an able though eccentric man, brought up Charlotte and her sisters in quite a Spartan fashion, inuring them to every kind of industry and fatigue. This object, however, was not judiciously carried out; the children were insufficiently nourished, were debarred from companionship and the usual amusements of childhood; and though to this training may no doubt in great part be ascribed the development of the peculiar genius which they subsequently displayed, there can be no doubt of its having contributed to foster the seeds of pulmonary disease, which afterwards cut them off at an untimely age. After an education received partly at home, and partly at the schools of Cowan's Bridge and Roe Head, Miss Brontë entered the latter for a time as a teacher, but soon found herself compelled by ill health to abandon the occupation. She then filled successively two situations as governess in a family, and in 1842 went with her sister Emily to Brussels, with the view of acquiring a knowledge of the French and German languages, and thereby qualifying themselves better to act as teachers. From Charlotte's life there much of the description in her novel of *Villette* is derived. In 1844 arrangements were entered into by her, in company with her sisters, to open a school at Haworth, but from the want of success in obtaining pupils no progress was ever made with their scheme. The two eldest daughters having died many years before, and an only brother having also gone, Charlotte, with her sisters Emily and Anne, were the only members of the family still remaining to their father. They resolved now to turn their attention to literary composition, for which their early studies well qualified them; and in 1846 a volume of poems by the three sisters was published, under the names of Currer, Ellis, and Acton Bell. It was issued at their own risk, and attracted little attention, so they quitted poetry for prose fiction, and produced such a novel. Charlotte (Currer Bell) entitled her production *The Professor*, but it was everywhere refused by the publishing trade, and was not given to the world till after her death. Emily (Ellis Bell) with her tale of *Wuthering Heights*, and Anne (Acton Bell) with *Agnes Grey*, were more successful, but neither of these works possesses much merit. Charlotte's failure, however, did not discourage her, and she composed the extraordinary novel of *Jane Eyre*, which found a purchaser in the firm of Messrs. Smith & Elder, and appeared in October, 1847. Its success was immediate and decided; and being published anonymously, numerous speculations were excited as to its authorship, many maintaining that the reflections expressed, and the general delineation of the characters in the story, were of too masculine an order to be the production of a woman, while at the same time it was perfectly evident that none but a woman could have executed some of the touches. Her second novel of *Shirley* appeared in 1849, but though both possessing considerable merit and tolerably successful, it falls far below *Jane Eyre*. Previous to this she had lost her two sisters, Emily dying on 19th Dec. 1848, and Anne on 28th May, 1849. She now visited London, and was for a time as one of its literary celebrities. In the autumn of 1852 appeared *Villette*, the scene of which is almost entirely laid in a school at Brussels, but it possesses nevertheless an immense interest, which never flags from the beginning to the end of the book. A painfully morbid tendency indeed, the result of an unhealthy physical organization, is conspicuous in this, as in the other writings of Charlotte Brontë. Shortly after its pub-

doation an offer of marriage was made to her by her father's curate, the Rev. Arthur Bell Nicholls, who had loved her long and silently, but owing to her father's objections their union was for a time impeded. Mr. Bronte ultimately changed his mind and gave his consent, and his daughter was married to Mr. Nicholls in June, 1854. Consumption, however, had already marked her, like her sisters, for a victim, and nine months after her marriage she expired at Haworth, in the churchyard of which she lies buried. Her originally rejected tale of *The Professor* was published after her death, in 1857, and the same year a biography of her appeared from the pen of Mrs. Gaskell.

BRONZE is an alloy of copper and tin. It was used by the ancient Assyrians and Egyptians. Layard brought many ornaments and other articles of this metal from Assyria. Bronze is more fusible, as well as harder than copper. It is also a fine-grained metal, taking a smooth and polished surface; hence its universal use, both in ancient and modern times, in making casts of all kinds, medallæ, bas-reliefs, statues, &c. Its colour is a reddish-yellow, and is darkened by exposure to the atmosphere. Its composition varies according to the purpose for which it is to be employed, and other constituents besides copper and tin frequently enter into it. Whatever alloy is principally formed of these metals, however, is called bronze. It has been found, on examination, that the bronze weapons of the Greeks and Romans were of the best composition for securing the greatest density in the alloy, and the cutting edges were brought to the highest point of tenacity by hammering. Gun-metal consists of about 90 parts of copper to 9 or 10 of tin. Old cannon are frequently used for casting statues, for which the proportions are similar. Bell-metal consists of 78 of copper and 22 of tin. For edge-tools—copper, 100 parts; tin, 14. For medals—copper, 89; tin, 8; zinc, 3, are used. For ornamental articles, zinc and lead are frequently added. These four metals are usually contained in the bronzes of France. There is some difficulty in making bronze, from the liability to the loss of tin, zinc, &c., by oxidation. A greenish colour is imparted to ancient bronzes by oxidation, which is imitated in modern bronzes by chemical appliances (see BRONZING). An alloy called *phosphor-bronze*, consisting of about 90 per cent of copper, 9 of tin, and from 5 to 75 of phosphorus has been found to have peculiar advantages for certain purposes. The addition of phosphorus increases the homogeneity of the compound, and by varying the proportion of the constituents, the hardness, tenacity, and elasticity of the alloy may be modified at pleasure. Great hardness and tenacity with little elasticity can be conferred on it for the making of ordnance, and hardness and tenacity combined with permanent elasticity can be given to it for the making of parts of machines, &c. In the elastic condition it is peculiarly well adapted for the bearings of machinery, since it produces very little friction. The addition of phosphorus has another important effect. When the proportion exceeds 5 per cent it gives a warmer colour to the bronze, making it resemble gold largely alloyed with copper. This form of the alloy is therefore largely used for works of art. The name of *steel-bronze* is given to bronze condensed and hardened artificially, as in the making of cannon the body of which is enlarged by forcing in several strong cylindrical liners of different sizes in succession. *Aluminium-bronze* is a gold-coloured alloy of copper and aluminium, *manganese-bronze* a bronze containing manganese and iron, possessing valuable properties.

BRONZES, in archaeology, works of art cast in bronze. Egyptian idols of bronze are contained in

the British Museum. The most celebrated antique bronze statues are, the Sleeping Satyr; the two youthful athletes; the colossal equestrian statue of Marcus Aurelius, at Rome; the Hercules of the capitol; the colossal head of Commodus; the statue of Septimius Severus in the Barberini Palace. Bas-reliefs, vaults, and doors of public edifices were ornamented with decorations of the same metal. Urban VIII took from the Pantheon alone 450,000 pounds of bronze, which he used for the ornaments of St. Peter's, and for the cannon of the castle of St. Angelo. One of these was composed wholly of bronze nails taken from the portico, and bore the inscription, *Ex clavis trabulibus porticus Agrippæ*. Bronze was considered by the ancients as sacred to the gods, and the Roman emperors who struck gold and silver coins could not strike them of bronze without the permission of the senate; hence the inscription S. C. (*Senatus consulto*). The words *moneta aurea* are found only on bronze medals. All the instruments of sacrifice and sacred vessels of the ancients were of bronze. (For the method of casting in bronze among the ancients, see Winckelmann's History of Art, book ii.) The moderns have also made much use of bronze, particularly for statues exposed to accidents or the influence of the atmosphere, and for casts of celebrated antiquities. The moulds are made on the pattern, of plaster and brick-dust. The parts are then covered on the inside with a coating of clay as thick as the bronze is intended to be. The mould is now closed and filled on its inside with a nucleus or core of plaster and brick-dust, mixed with water. When this is done the mould is opened, and the clay carefully removed. The mould, with its core, is then thoroughly dried, and the core secured in its position by bars of bronze, which pass into it through the external part of the mould. The whole is then bound with iron hoops, and the melted bronze being poured in through an aperture left for the purpose fills the cavity previously occupied by the clay, and forms a metallic covering to the core. It is afterwards made smooth by mechanical means.

BRONZING. Bronze of a good quality acquires by oxidation a fine green tint, called *patina viridis*, or, by the Romans, *terzo*. Sal-ammoniac and salt of sorrel dissolved in vinegar, and applied with a soft rag or brush, will produce this result. The process must be repeated several times to have its full effect. The proportions given by Dr. Ure are three-fourths of an ounce of sal-ammoniac, and a drachm and a half of salt of sorrel, to a quart of vinegar. Bronzing is also the process by which a body of plaster, wood, or metal is made to receive a bronze-like surface. Brass castings are bronzed by the application, after cleaning and brightening them, of vinegar and sal-ammoniac. A variety of liquid solutions are prepared for bronzing copper and other metals, in which verdigris, sal-ammoniac, salt of sorrel, cinabar, alum, and common salt are employed. To bronze wood and other articles, waste gold-leaf, ground in with honey and washed, or mosaic gold ground with bone ashes, is applied, with size or oil varnish. Gypsum casts are bronzed with black-lead.

BRONZINO, ANGELO, a painter of the Florentine school, was born near Florence about 1500, died about 1572. He was a pupil of Jacopo da Pontormo, and an admirer and imitator of Michael Angelo. He painted a great number of portraits; and his historical paintings are distinguished by the striking and pleasing features of the heads which they contain. One of his best paintings is a Christ in the church Santa Croce, at Florence. It is remarkable for its grouping and colouring, as well as for the heads, many of which are the portraits of his friends and contemporaries; yet it is not altogether free from mannerism and

affection. Some persons have found fault with the nakedness of his figures.

BROOCH, the name for a class of ornaments worn on the dress, to which they are attached by a pin stuck through the fabric. Brooches are of great antiquity, and were formerly worn by men as well as women. They were used by both sexes among the Greeks and Romans, and also in the middle ages. Among the Highlanders of Scotland there are preserved, in several families, ancient brooches of rich workmanship and highly ornamented. Some of them are inscribed with characters to which particular virtues were attributed, and seem to have been used as a sort of amulet or talisman.

BROODING. See **INCUBATION**.

BROOKE, HENRY, dramatist and novelist, the son of an Irish clergyman, was born in 1706; died 1788. He was educated at Dublin University, and intended for the law. When very young he married his prospects by falling in love with his cousin, who was only fourteen when she presented him with his first child. She was afterwards the mother of other sixteen, and lived in perfect harmony with him for the long period of fifty years. Brooke began to practise at the bar; but his taste was decided for poetry and general literature, and he came forward as an author by publishing a tragedy called *Gustavus Vasa*, which was remarkably popular at the time, and was translated into French, though it is now almost forgotten. He wrote several other tragedies, and also several novels, one of which, the *Fool of Quality*, possesses considerable merit, and was republished with a preface by Rev. Charles Kingsley. The death of his wife, and the loss of a favourite child, completely broke his spirit, and he lived for a short time in a state of second childhood.

BROOKE, SIR JAMES, celebrated as the Rajah of Sarawak, was born in Bengal in 1803; and died at Barston, in Devonshire, 11th June, 1868. He was brought at an early age to England, and having completed his education there he obtained a cadetship in the Indian army. He distinguished himself in the Burmese war (1826), and was so severely wounded that he had to come home to England for the benefit of his health. On his way back to India he was shipwrecked, and having thus exceeded his leave of absence and forfeited his appointment, he gave up thoughts of a military career, and sailed on to China. On this voyage there rose in his mind the idea of ridding the Eastern Archipelago from the scourge of piracy, and ameliorating the condition of the inhabitants. Accordingly on his return to England, having come into the possession of a large fortune by the death of his father, he bought one of the royal yachts, named the *Royalist*, and after a preliminary cruise in the Mediterranean, set sail for the East (Oct. 1838). Having directed his course to the island of Borneo, he found Muda Hassim, uncle of the King of Borneo, and Rajah of Sarawak, a district on the N.W. coast of the island, engaged in suppressing a revolt. The rajah being hard pressed, agreed to make him his successor in return for his assistance. The offer was accepted. Brooke took command of the rajah's army, and speedily reduced the rebels to submission. Being now established in the government, and recognized as Rajah of Sarawak by the Sultan of Borneo (1841), he endeavoured to induce the Dyak natives to abandon their irregular and piratical mode of life, and to turn themselves to agriculture and commerce. For this end he published a code of laws, establishing free trade and personal equality, and declaring piracy a crime punishable with death. His efforts were wonderfully successful. In conjunction with the British naval commanders he carried on war against the pirates with great vigour. A sum of money was

paid by government for the head of each pirate, and under this system the Malay rovers were soon almost extirpated. The severity of this war of extermination gave rise to a certain degree of dissatisfaction in England; but notwithstanding this, on his return in 1847, Mr. Brooke was received with general favour, his position was recognized by the government, he received the honour of Knight Commander of the Bath, and was made governor of Labuan, an island near Sarawak which had been acquired by the British. After his return to Borneo he continued to labour as before for the extension of British influence. In 1860 he went as ambassador to Siam, and not long after he gave up his post as governor of Labuan. On the outbreak of the war with China in 1857, his residence was suddenly attacked by about 4000 Chinese, and he himself only escaped by swimming across the river. His adherents soon rallied, however, and at the head of a large body of Malays and Dyaks he drove the Chinese from Sarawak with the loss of half their number. The following year he came to England to recruit his health. He returned to Borneo in 1860. In 1863 he finally returned to England, leaving the government in the hands of his nephew, Charles Brooke. Whatever may be thought of the policy of Sir James Brooke, there can be no doubt as to the benefits derived from it by the people of Sarawak. He established civilization and opened up a trade where previously they had scarcely any existence. Under his administration Sarawak increased from a village of 1000 inhabitants to a town of 16,000, while the trade increased in the same proportion.

BROOKLYN, formerly a separate city of the United States, now a 'borough' of Greater New York, on the W. end of Long Island, separated from New York proper by East River, a strait about three-quarters of a mile broad, crossed by steam-ferries, and by a celebrated suspension bridge (see *BUNGE*). The population at the time of annexation to New York was about 1,200,000. Brooklyn is very attractively laid out, having broad, straight streets, many of them planted with rows of trees. The site is elevated and uneven, and has caused much labour to be expended in grading. A prominence near the East River, called the Heights, 70 feet above the sea-level, affords a magnificent view of the city and harbour of New York. Among the public buildings are the city hall, of white marble, the jail, the lyceum, the county court-house, the academy of music, and over 400 churches. The literary and charitable institutions are very numerous. The Atlantic Dock is one of the largest in the States, covering 40 acres. It is one of the largest grain depots in the world. The outer pier in Buttermilk Channel extends for 3000 feet. This channel, formerly a narrow passage, is now of sufficient width to admit the largest vessels. The United States navy-yard, on Wallabout Bay, occupies 45 acres, and the dry dock connected with it cost \$1,000,000. Brooklyn is a favourite residence of the wealthy New Yorkers. On the breaking out of the civil war a great part of the tobacco manufacture of Richmond was transferred hither. It has a large trade in flour, sugar, whisky, and manufactures of various kinds. It was founded in 1625, and in 1898 was included in New York municipality.

BROOM, a popular name which includes several allied genera of plants of the natural order Leguminosæ, and of the sub-order Papilionaceæ, plants distinguished by a leguminous fruit and papilionaceous flowers. The common broom (*Cytisus scoparius*) is a large bushy shrub, with long straight angular branches, of a dark-green colour, smooth and tough. Its leaves are deciduous. The flowers are of a deep golden-yellow colour, large, and butterfly-shaped. This is a handsome shrub and one of the most useful of

the common plants of Great Britain, and is indigenous to great part of Europe and Northern Asia, being able to stand a severer climate than furze. Its twigs are tied in bundles, and formed into brooms. The fibrous and elastic parts of the bark may be made into cordage, matting, and even into a coarse kind of cloth. The twigs and young branches have been successfully employed as a substitute for oak-bark in tanning leather. They may also be rendered serviceable as thatch for houses and corn-ricks. The flower-buds, when pickled, have occasionally been used as a substitute for capers. The wood, when the dimensions are sufficient for the purpose, is employed by cabinetmakers and turners. An infusion or decoction of the young shoots or the seeds is sometimes used medicinally, having strong diuretic properties. There is a white-flowered species (*C. albus*), a native of the Mediterranean regions.—*Spanish Broom*, or *Spart* (*Spartium junceum*), is an ornamental flowering shrub, growing in Africa, Spain, Italy, and the s. of France, where it is often made use of to turn dry, unfertile soils or exposed slopes to account. It is also common in English gardens; has upright round branches, that flower at the top, and spear-shaped leaves. In the province of Valencia, and other parts of Spain, great attention is paid to the manufacture of various articles from the twigs and bark of this shrub. They are plaited into mats, carpets, covering for plants, baskets, ropes, and even shoes. There are various other species of broom besides those enumerated.

BROSELEY, a market town, Shropshire, England. The town is situated on the summit of a hill, rising abruptly from the Severn, 13 miles s.e. of Shrewsbury, and consists chiefly of one street, straight and well kept; but the other parts of the town are extremely irregular. It has a handsome town-hall, a beautiful Gothic church, various Dissenting chapels, several schools, and manufactures of tobacco-pipes, tiles, and fire-bricks, for which this place has long been noted. Pop. in 1901, 4780.

BROSSES, CHARLES DE, first president of the Parliament of Burgundy, was born at Dijon in 1709; died in 1777. He applied himself to the study of law, and at the same time did not neglect the arts and sciences. His intimate acquaintance with Roman history produced in him a desire of visiting Italy, whither he went in 1739. On his return he published his *Letters on the Condition of the City Herulaneum* (Dijon, 1750). At the request of Buffon, who had been his friend from youth, he wrote a *History of the Voyages to Australasia* (*Histoire des Navigations aux Terres Australes*), 1766. In 1760 appeared his treatise, published anonymously, *De Culte des Dieux Fétiches*. A work of a very different kind succeeded this, and displayed the extent and variety of the author's learning. This was a *Treatise on the Mechanical Formation of Languages* (*Traité de la Formation Mécanique des Langues*), 1765. It contained, together with many imperfections, numerous curious and profound investigations, ingenious conjectures, and penetrating views. De Brosse employed himself, through his whole life, on a work which was held in no slight estimation by the learned. This was a translation of Sallust, in which he laboured to supply the lost parts of this historian. For this purpose he collected above 700 fragments of Sallust, by means of which, with some important additions, he composed a history of the seventh century of the Roman Republic, displaying a great extent of erudition (*Histoire de la République Romaine, dans le cours du 7^e siècle*), Dijon, 1777. The work would have been received with greater approbation if the grace of style had been joined to

the depth and sagacity of research which it manifests. Though these various labours claimed a large portion of his time, yet they did not hinder him from attending to the duties of his office.

BROTHERHOOD, HOLY. See **HERMANDAD**.

BROTHERHOODS. See **FRATERNITIES**.

BROTHERS, male children of the same father or mother, or both. Among the ancients the term was employed to denote more remote relations. Thus, among the Jews, Abraham was called the brother of Lot, his nephew. By the civil law, brothers and sisters stand in the second degree of consanguinity; by the canon law, they are in the first degree. In the monastic and military orders the members were called brothers, as being united in one family. In Europe, the kings address each other by the title of brother.

BROTHERS, RICHARD, a fanatic and self-styled prophet, began his career about 1793, and died in 1824. He served as a lieutenant in the army, which he quitted in 1789, refusing from conscientious scruples to take the oath necessary to entitle him to his half-pay. He was consequently reduced to distress, and ultimately had to take refuge in the work-house. He announced himself in 1793 as the apostle of a new religion, dating his call from 1790. He styled himself the 'Nephew of the Almighty, and Prince of the Hebrews, appointed to lead them to the land of Canaan.' He published, in 1794, *A Revealed Knowledge of the Prophecies and Times*, in two books. Book 1, 'wrote under the direction of the Lord God,' relates to the restoration of the Hebrews. Book 2 contains the 'Sudden and Perpetual Fall of the Turkish, German, and Russian Empires,' &c. Many other works followed, among which one is worth mentioning for its oddity: *A letter to Miss Cott, the recorded daughter of King David, and future Queen of the Hebrews*. Brother's prophetic career coming under the notice of government, he was first committed to Newgate for prophesying the death of the king, and subsequently to Bedlam as a dangerous lunatic, but was released in 1806. Strange to say, he had found followers and defenders even among the ranks of educated men. Some particular events in European history appeared to coincide with some of his prophecies, and this caused all their absurdities and blasphemies to be forgotten or overlooked. Among his disciples was Sharp, the celebrated engraver, and a man of still greater distinction, Nathaniel Brassey Halhed, the orientalist, then member of Parliament for Lyngton, who avowed in the House of Commons his belief in the prophetic powers of Brothers, and denounced his imprisonment as persecution.

BROUGHAM, HENRY, BARON BROUGHAM AND VAUX, was born at Edinburgh on the 19th September, 1778; died at Cannes 7th May, 1868. His father, Henry Brougham, belonged to an old Westmoreland family, and his mother, Eleonora Syme, was a niece of Robertson the historian. He was educated at the High School and the University of Edinburgh, entering the latter at the age of sixteen. At the early age of eighteen he wrote an essay on the Refraction and Reflection of Light, which, being sent to the Royal Society, was thought worthy of being printed in their *Transactions* for 1796. He contributed a paper to each of the next two volumes of the *Royal Society's Transactions* also. On leaving college he devoted himself to the study of law at Edinburgh, and was admitted a member of the Society of Advocates in 1800. As a member of the Speculative Club he was brought into contact with Jeffrey, Horner, and others afterwards famous; and along with the above-mentioned writers and Sydney Smith bore a chief part in the starting of the Edinburgh

Review in 1802, to which he contributed a great number of articles. In 1803 appeared his *Inquiry into the Colonial Policy of the European Powers* (Edin. two vols.), a work which showed a wide extent of knowledge in the author, and drew upon him considerable attention. In it he expressed his decided hostility to the slave-trade. Finding too circumscribed a field for his abilities in Edinburgh, he removed to London, and in 1808 was called to the English bar. One of the first occasions on which he distinguished himself in his professional capacity was in 1810, when he spoke before the House of Lords in behalf of some Liverpool merchants who wished the repeal of the 'Orders in Council,' prohibiting trade with the states subject to France. The same year he entered Parliament as member for the rotten borough of Camelford, joined the Whig party, which was in opposition, and soon after obtained the passing of a measure making the slave-trade felony. He also succeeded, before the dissolution of Parliament, in getting the Orders in Council repealed. At the general election in 1812 he endeavoured to get himself elected as one of the members for Liverpool, but was defeated by Canning, and remained without a seat till 1816, when he was returned for Winchester. He represented this borough up to 1830. On his return to Parliament he began his life-long efforts in the cause of education by obtaining the appointment of a committee to inquire into the state of education among the poor of the metropolis. In 1819 he and his friends established a model school for the children of the poorer classes in London. In 1823 he was instrumental in founding the first mechanics' institute. In 1825 he published his *Practical Observations upon the Education of the People*, which ran through twenty editions. The same year he was elected Lord Rector of Glasgow University; and also introduced a bill into Parliament for the incorporation of the London University, of which he may be considered one of the chief founders. He also bore an active part in establishing the Society for the Diffusion of Useful Knowledge in 1827, the first publication of which was his *Discourse on the Objects, Pleasures, and Advantages of Science*. Meantime his reputation as a brilliant speaker and able advocate had been gradually increasing, and his fearless and successful defence of Queen Caroline in 1820 and 1821 placed him on the pinnacle of popular favour. Two of the speeches spoken by him in this course are looked upon as classic specimens of English eloquence. The part he took in defence of the queen brought him into disfavour with the king, however, and delayed his promotion some years, so that it was not till 1827 that he was made a king's counsel. In Parliament he continued to speak against negro slavery, and in favour of what may be considered the most valuable of the reforms that we owe to him, viz. the amendment of the common law and of the judicial administration. On this subject he delivered a famous speech of six hours' duration, on Feb. 7, 1828. At the general election of 1830 he was returned for the large and important county of York, an honour which he attributed chiefly to a celebrated speech delivered by him shortly before on the slave-trade. In the ministry of Earl Grey he accepted the post of lord-chancellor, and was raised to the peerage (22d Nov. 1830) with the title of Baron Brougham and Vaux. The Reform Bill of 1832 received his warmest support in the House of Lords. In 1834, when the Whig ministry were dismissed, Lord Brougham of course lost the chancellorship, and this proved the end of his official life, as he was never afterwards a member of any ministry. Henceforth he devoted himself chiefly to legal and social reforms, maintaining, we need scarcely say, his hostile

attitude to slavery, and continuing his labours in the cause of popular education. He was a zealous opponent of the corn-laws. In connection with the acts of his later years, we may mention his presidency of the Law Amendment Society, and of the Social Science Association. He latterly resided much at Capnes, in the s. of France, where he died. He married in 1819, and had two daughters, one of whom died in infancy in 1820, the other in 1839, at the age of seventeen. His wife was Mary Anne Eden, daughter of Thomas Eden, Esq., and grand-daughter of Sir Robert Eden, Bart., of West Auckland, in the county of Durham.—Lord Brougham accomplished a large amount of literary work, contributing to newspapers, reviews, and encyclopedias, besides writing several independent works; and he had no mean reputation in mathematics and physical science. His works, collected by himself, and published in ten vols. (Edin. 1855–57), include—1st. *Lives of Men of Science*, time of George III.; 2d. *Lives of Men of Letters*, time of George III.; 3d, 4th, and 5th. *Eminent Statesmen*; 6th. *Natural Theology*; 7th. *Rhetorical and Literary Dissertations and Addresses*; 8th. *Rhetorical and Political Dissertations*; 9th and 10th. *Speeches on Social and Political Subjects*. He also, along with Sir Charles Bell, brought out an edition of Paley's *Natural Theology*; translated the oration of Demosthenes on the Crown; and in 1855, conjointly with Mr. E. J. Routh, published an *Analytical View of Sir Isaac Newton's Principia*. Besides being chosen Lord Rector of Glasgow University, he was president of University College, London, chancellor of Edinburgh University, D.C.L. of Oxford, and a member of the Institute of France. Lord Brougham must be looked upon as one of the most remarkable men of this century. His energy and industry were enormous, his versatility surprising. He was a mathematician, a historian, a biographer, an essayist, a moral and political philosopher, a lawyer, an orator, and a statesman. It is chiefly in the latter capacities that he will be remembered. As an orator and parliamentary debater he was inferior to Canning alone. In rapid and forcible diction he was unsurpassed; and when argument, invective, sarcasm, wit, and humour were all mingled together—and the words came rushing forth, every one true to the mark—it was no wonder that Lord Brougham was a most formidable opponent.

BROUGHTON, LORD, THE RIGHT HON. SIR JOHN CAM HOEHOUSE, G.C.B., P.C., F.R.S., Baron Broughton, of Broughton de Gifford, in the county of Wilts, and a baronet; born 27th June, 1786; died 3d June, 1869; was the son of Sir Benjamin Hoehouse, first baronet, and of Charlotte, daughter and heiress of Samuel Cam, Esq., of the Chantry, Wilts. He was educated at Westminster School and Trinity College, Cambridge, where he graduated B.A. in 1808, and M.A. in 1811. He was an intimate friend of Lord Byron, and accompanied him in his travels to Greece and Turkey in 1809. He published in 1812 an account of this voyage, entitled *Journey into Albania and other Provinces of the Turkish Empire*. In the years 1813 and 1814 he accompanied the allied armies in Germany, and was present at the battle of Dresden. He also accompanied Byron to Italy in 1816–17, and visited Rome and Venice together with him. He suggested an extension of the fourth canto of *Childe Harold*, which Byron dedicated to him, and by arrangement with the poet he undertook to write for it a series of notes, for which his observations during their journey furnished materials. These notes were written at Venice, where he had the advantage of the ducal library, and were so expanded with dissertations on history, architecture, &c., as ultimately to form a separate work,

which was published by Murray in 1818; *Historical Illustrations of the Fourth Canto of Childe Harold*, containing *Dissertations on the Ruins of Rome*, and an *Essay on Italian Literature*. Hobhouse was an advanced Liberal in politics, and on his return took an active part in the advocacy of reforms. In 1816 he published anonymously, in two 8vo volumes, *The Substance of some Letters written by an English Gentleman resident at Paris during the last reign of the Emperor Napoleon*, in which he proposed to give a true account of the Hundred Days. This work, from its hostility to the Bourbon cause, gave great offence to the governments of France and England, and the translator and the publisher of a French translation were fined and imprisoned. An anonymous pamphlet of his, called *The Trifling Mistake*, being charged in the House of Commons with advocating rebellion, he acknowledged the authorship, and was, by the speaker's warrant of 18th December, 1819, arrested and committed to Newgate. The death of George III. at the beginning of 1820 caused a dissolution of Parliament, and after a short delay he was released. At the general election that year he was returned for Westminster, and soon after his election he defended the Liberals of Oldham against an aggression on the part of the cabinet of Lord Liverpool, which had put down by force a great reform meeting in that place. He supported the Reform Bill of 1832, the repeal of the Test and Corporation Acts, the removal of the Catholic disabilities, and other liberal measures of the period. In Feb. 1832, he entered Lord Melbourne's ministry as secretary at war, and became a privy-councillor. In 1833 he was made chief-secretary for Ireland, but lost his seat in seeking for re-election. On the reconstruction of the cabinet under Lord Melbourne, in 1834, he was made chief commissioner for woods and forests, and was elected for Nottingham. The ministry resigned in autumn, and returned to power in April, 1835, when he was appointed president of the board of control. He held this office till Sept. 1841, and in Lord Russell's administration, 1846-52. He lost his seat for Nottingham in 1847, but a seat was found for him at Harwich, which he continued to occupy till he was raised to the peerage in 1851. He had succeeded his father as baronet in 1831. From the time of his elevation to the peerage he took less interest in political affairs, and he rarely spoke in the House of Lords. During his retirement he returned to the literary tastes of his youth, to the cultivation of the classics, of which he was always an admirer, and to the enjoyment of the society of a large circle of friends. Lord Broughton married in 1828 Lady Julia Hay, youngest daughter of the Marquis of Tweeddale, who died in 1835. He had three daughters, but as he left no male issue, the peerage became extinct. Besides the works referred to, Lord Broughton published *Imitations and Translations from the Ancient and Modern Classics*, together with *Original Poems* (London, 1809).

BROUGHTY-FERRY, a marine town and watering place in Scotland, in the county of Forfar, on the N. shore of the estuary of the Tay, 3 miles E. of Dundee, on the Dundee and Arbroath Joint Railway, and having through connection with the South by way of the Tay and Forth bridges. The ferry across the Tay to Tayport is now of little importance. The houses are of stone, and generally well built, while many of those of modern erection are extremely neat and tasteful. Handsome villas, in various styles of architecture, belonging to Dundee merchants and manufacturers, are numerous. Several of the churches are elegant structures. Some of the population are employed in fishing, but this industry is declining. There are no manufactures. At the

eastern extremity of the town, on a rocky eminence projecting into the sea, stands the old castle of Broughty, dating from 1498. It has been purchased by government, and several heavy guns mounted in it. Pop. in 1871, 6817; in 1881, 7407; in 1891, 9256; in 1901, 10,482.

BROUNCKER, or **BROUNKER**, WILLIAM, born in 1620, became Viscount Brouncker of Castle-Lyons, in Ireland, by the death of his father, on whom that title had been conferred. He was strongly attached to the royal cause, and in 1660 was one of the first to sign the declaration which hailed Monk as the restorer of the laws and privileges of the nation. On the Restoration he was appointed to several lucrative offices, and on the formation and incorporation of the Royal Society became its first president. This honourable office he continued to hold for fifteen years. His mathematical attainments must have been of a high order, as he is admitted to have been the discoverer of Continued Fractions, and of an important theorem relating to the quadrature of the equilateral hyperbola. He also published experiments on the Recoiling of Guns, and a translation of Descartes' *Musices Compendium*, with notes. He died in 1684.

BROUSSA. See **BRUSSA**.

BROUSSAIS, FRANÇOIS JOSEPH VICTOR, celebrated French physician, was born at Saint Malo on Dec. 17th, 1772, died at Vitry-sur-Seine on Nov. 17th, 1838. Educated at the college of Dinan, he entered the army and soon attained the rank of sergeant; but a severe illness caused him to give up a military career and devote himself to medicine. He studied at Brest and Paris, and in 1820 obtained a professorship at Val-de-Grâce, a chair which he exchanged in 1831 for that of general pathology in the faculty of medicine at Paris. His first important work was his *Recherches sur la Fièvre Hectique* (1803), which was followed by the still more celebrated *Histoire des Phlegmasies ou Inflammations Chroniques* (2 vols., 1808), and *Examen de la Doctrine Médicale généralement adoptée et des Systèmes Modernes de Nosologie* (1816). In these works he propounded what is known as the physiological system of medicine. According to him irritability is the fundamental property of all living animal tissues, and diseases are produced by an undue increase or diminution of that property. Broussais also taught and wrote on phrenology.

BROUSSON, CLAUDE, born at Nîmes in 1647, was educated for the law, and practised as an advocate first at Castres and Cast-inaudary, and afterwards in the Parliament of Toulouse, where the Protestants, to whom he belonged, were often indebted to him for the zeal and ability with which he defended their cause. In 1683, when the government had resolved on recalling the edict of Nantes, and trying the effect of persecution as a means of suppressing the Reformation, it was at Brousson's house the deputies from all the churches assembled, and resolved that, even were their churches destroyed they would still hold their meetings, though it should be under the canopy of heaven. His part in this and other important movements marked him out as one of the first objects of attack; and on receiving warning of an intention to arrest him, he sought an asylum at Lausanne, where he published several works, exposing the persecutions to which the Protestants of France were subjected, and awakening the sympathy of their brethren in all other parts of Europe. Nor was he satisfied merely to aid the cause with his pen. At the hazard of his life he returned to France, and continued for four years among the recesses of the Cévennes, preaching the gospel. In 1698 he repaired to Holland, where a pension was given him by the states-general; and he might easily have led

a life of ease and comfort, but the sufferings of his persecuted countrymen were ever uppermost in his mind, and he both visited many of the courts of Europe to plead their cause, and repeatedly revisited France for the purpose of administering instruction and comfort, and urging to perseverance. So much zeal was evidently a prelude to the martyr's crown, and accordingly, on a mission into France, he was arrested at Oleron, tried at Montpellier, condemned to be broken on the wheel, and executed accordingly in 1698.

BROUSSONET, PIERRE MARIE AUGUSTE, a distinguished naturalist, born at Montpellier in 1761; died in 1807. After studying medicine at Montpellier under his father, he visited Paris, where he devoted himself particularly to natural history; and with the view of prosecuting it passed over into England and studied ichthyology under the direction of Sir Joseph Banks. After three years' residence in England he returned to France, and became the assistant of Daubenton in the College of France and the veterinary school. At this period he communicated a number of valuable papers to the Academy of Sciences, and obtained a seat in its body. In 1785 he was appointed secretary to the Paris Agricultural Society, and turning his attention to the objects especially embraced by it, wrote or contributed to several important works of a practical nature. The first flock of merinos from Spain, and of Angora goats from the Levant, was introduced by him. The revolution now broke out, and he became connected with the party of the Girondists. On the downfall of that party he was arrested at Montpellier, but having escaped, crossed the Pyrenees under the pretext of botanizing, and arrived in Spain in a state of great destitution. Sir Joseph Banks, on being informed of it, generously sent him a letter of credit for a sum sufficient to meet all his wants. He afterwards set sail for the Indies in an English vessel, which was driven back by a storm into the port of Lisbon. He next passed over into Africa as physician to Mr. Simpson, ambassador of the United States to the Emperor of Morocco, and resumed his botanical studies, making some important collections, which he sent to Sir Joseph Banks. Circumstances now permitted his return to France, where he was appointed consul to Mogador and traveller to the Institute. He also received the appointment of consul to the Canaries, where he resided for some time, and collected materials for his work *Economical Flora of the Canaries*, which describes 1600 plants. He next returned to France to occupy the chair of botany at Montpellier. In 1805 he became a member of the corps législatif. He died from the effects of a fall by which the brain had been seriously injured. This is said to have had the curious effect of causing him to lose his memory for proper names and other substantives, while he had still an abundance of adjectives at his command. In compliment to him a class of dicious plants, from which the Chinese manufacture paper and the South Sea Islanders the greater part of their clothing, has been named *Broussonetia*.

BROUWER, or BRAUWER, ADRIAAN, a celebrated painter, of the Dutch school, was born at Haarlem, in 1608, or more probably at Oudenarde, where his father was a painter of common paper-hangings. He died in hospital at Antwerp, in 1640. Poverty contributed, perhaps, to fortify his talents. When a child, he painted flowers and birds to be stitched on caps, which were sold by his mother. Francis Hals, a skilful painter, expecting to profit by the talents of the young artist, took him to Haarlem. Here, amidst wearisome labours and poor diet, Brouwer spent the greater part of his time in a garret, occupied

in making little paintings of the value of which he was ignorant, while Hals kept the profits of them for himself. Two pretty paintings of his, *The Five Senses* and *The Twelve Months*, are mentioned as belonging to that period. By the advice of Adrian of Ostade, his fellow pupil, he escaped to Amsterdam, where he was surprised to hear that his paintings were esteemed. He now gained considerable sums by his labours; but instead of devoting himself to his art, he made the inn his workshop, never exerting himself till the hostess insisted upon payment. He threw into the fire a painting for which he did not receive the price demanded, and began a new one with more care. Having gone to Antwerp during the wars of the Low Countries, he was thrown into prison as a spy. He declared that he was a painter, appealing to the Duke of Ahremberg, who was likewise imprisoned there; and at the prince's intercession, having been provided with materials, he painted his guards playing at cards, with so much expression and truth, that Rubens, at the sight of the picture, exclaimed, 'This is Brouwer's work; none but he can succeed so well in such subjects.' Rubens effected his release by standing bail for him, clothed him, and received him into his house and at his table. Brouwer, however, instead of being grateful for this generosity, escaped secretly, to plunge into still greater extravagances. He took lodgings with a baker, Craeckbeke, who became a skilful painter by his instructions. This man, whose inclinations agreed with those of Brouwer, had a handsome wife, and the connection between these three persons became so intimate, that they were obliged to flee from justice. Brouwer went to Paris, but finding no employment there returned to Antwerp, where he died. Rubens, who remembered only his talents, caused him to be honourably buried in the church of the Carmelites. All the pictures of Brouwer show what sort of places and company this artist frequented. He did not, however, like Teniers, understand how to give to mean objects the variety of which they are susceptible. Nevertheless, his paintings command high prices from amateurs. It would indeed be difficult to excel Brouwer in power and harmony of colouring, in the management of the *chiaroscuro*, and in truth of expression.

BROWN, CHARLES BROCKDEN, an eminent American novelist, was born in Philadelphia in 1771; died 1810. He descended from a family of Quakers, was remarkable in his childhood for his attachment to books, and at the age of sixteen, after having received a liberal education, had already formed plans of extensive literary works. The profession of which he made choice was the law. He was apprenticed to an eminent member of the Philadelphia bar, but during the term intended for preparatory legal study, was, in fact, principally occupied with literary pursuits. The delicacy of his constitution, moreover, incapacitated him for the bustle of business and all athletic amusements. During frequent visits to New York he became intimate with a literary club, who fostered his devotion to letters, and increased his eagerness to be conspicuous as a writer. He kept minute journals, indited essays and dissertations, and cultivated, with unremitting assiduity, the arts of composition. The first novel which he wrote was entitled *Sky Walk*, but it was never published. His first published novel was called *Wieland*, and appeared in 1798. It soon acquired the reputation of a powerful and original romance. The next published, in the following year, was *Ormond*, or the *Secret Witness*, which had neither the success nor the merit of the other, but still exhibits uncommon powers of invention and description. At this time Brown had begun no less than five novels, two of which—Arthur Mervyn and *Edgar Huntley*—were com-

pleted and sent forth almost immediately. In Arthur Mervyn, the ravages of the yellow fever, which the author had witnessed in New York and Philadelphia, are painted with terrific truth. All these compositions abound both with excellencies and faults, and bear a character of originality. In 1801 he published another novel—*Clara Howard*—less open to exception, but also less deserving of praise. Its form is different from that of the others, being epistolary. The last of his novels was *Jane Talbot*, originally published in London, in 1804. It is deficient in interest, and indeed in all respects inferior to its predecessors. In April, 1799, Brown published the first number of the *Monthly Magazine and American Review*. This work he continued with great industry and ability until the end of the year 1800. He wrote abundantly for it. Circumstances compelled him to relinquish it; but in 1805 he commenced another journal, with the title of the *Literary Magazine and American Register*; and in this undertaking he persevered for five years. In 1806 he entered upon a new work, a semi-annual *American Register*, five volumes of which he lived to complete and publish. It is now and must long be consulted as a valuable body of annals. We have already mentioned the delicacy of Brown's constitution. In 1809 it was discovered that his lungs were seriously affected, and he then consented to travel for the recovery of his health. The remedy, however, was applied too late. In November of that year, after an excursion into the states of New Jersey and New York, he betook himself to his chamber, as he thought, for a few days; but his confinement lasted until February, and ended only with his life. He expired on the 22d of that month, at the age of thirty-nine. His writings are characterized by rich diction, variety of incident, and vivid representation, but he deals too much in the extravagant and the horrible.

BROWN, GEORGE, Count, an Irishman, field-marshal in the service of Russia, was born in 1698; entered the Russian service in 1730, and died in 1792. He distinguished himself in several wars, and Peter III. made him governor of Livonia, in which post he remained thirty years. He was not less honoured by Catharine II.

BROWN, JOHN, an eminent and learned minister at Haddington, who was born in Perthshire in 1722, and died 19th June, 1787. By his own intense application to study he became acquainted with the French, Italian, German, Arabic, Persian, Syriac, and Ethiopic languages, as well as the Greek and Hebrew. Notwithstanding this great acquisition of knowledge, it is said he was never under the tuition of a master, except about a month. In summer he rose between four and five in the morning; in winter at six; and prosecuted his studies till eight in the evening. The hours which thousands waste in sleep he occupied in prayer, reading, or writing. In general he preached three sermons every Sabbath-day. He was accounted very liberal as to his property, and was of opinion that every man ought at least to give the tenth of his income to charitable purposes. He was appointed professor of theology to the Associate Synod in 1768. His most important works are: *The Self-Interpreting Bible*; *Dictionary of the Bible*; *Explication of the Assembly's Catechism*; *The Christian Journal*; *Explication of Scripture Metaphors*; *System of Divinity*; *General History of the Church*; *Particular History of the Churches of England, Scotland, and Ireland*; and *Harmony of Scripture Prophecies*. His *Dictionary of the Bible and Self-Interpreting Bible*, so called from the copious marginal references to other passages of Scripture by which it is distinguished, have gone through many editions.

BROWN, JOHN, M.D., the author of the Brunonian system in medicine, was born in the parish of Bunkle, in the county of Berwick, in the year 1735; died in London, 1788. His parents were in a very humble sphere in life, his father being merely a day labourer. Like the children of other Scottish cottars, however, he received the advantage of being educated at the parish-school, where he was very soon distinguished for his abilities, and the rapid progress he made in his studies. His father having died, his mother married a weaver, and young Brown was bound an apprentice to that business; but the distaste he evinced for it was so great as to induce his step-father to capsol his indentures, and remove him to the grammar-school of Dunse, where he was looked upon as quite a prodigy—reading all the Latin authors with the greatest facility, and soon making considerable progress in Greek. In 1755 he went to Edinburgh, with the intention of studying divinity and entering the church, but he soon abandoned his theological studies. Having been employed by a medical student to translate his theses into Latin, he succeeded so well, that the elegance and purity of the language attracted the notice and encomiums of the professors and led to his commencing the study of medicine. Dr. Cullen in particular was soon attracted by his remarkable talents, and employed him as a tutor to his sons. In the year 1765 he married, and opened a boarding-house for the accommodation of medical students; but being irregular and intemperate in his habits he was soon reduced to bankruptcy. A professor's chair now fell vacant, for which he became a candidate, but, being unsuccessful, he attributed his want of success to the jealousy of Dr. Cullen, and a rupture ensued between them. Having taken the degree of Doctor in Medicine at St. Andrew's, he commenced practice in Edinburgh, and introduced his celebrated work, entitled the *Elements of Medicine*. He then commenced lecturing on the practice of physic, and made use of this work as his text-book. He divided all diseases into two classes, those resulting from a deficiency, and those resulting from an excess of excitement; the one class to be treated with stimulants, the other with debilitating medicines. Becoming involved in pecuniary embarrassments he removed to London in 1786, where he died two years later. The system of physic which he taught, though no longer accepted as a system, had a distinct influence on subsequent practice.

BROWN, LANDSELOT, a celebrated landscape gardener and improver of grounds, sometimes called 'Capability Brown,' was born in 1715, at Kirkharle, in Northumberland; died in 1778. He commenced life as a kitchen gardener, but, by his industry and genius, rose rapidly in public estimation till he came to be regarded as a kind of oracle in taste in regard to all rural improvements, agricultural, horticultural, and even architectural. His extensive employment enabled him to realize a handsome independence, and he adorned the station to which he had worked his way with more graces and virtues than are often displayed by those who have been born to it. He obtained the dignity of high sheriff of Huntingdon in 1770. He avoided the stiff formality of the older landscape gardeners, but is charged with having often aimed against good taste by endeavouring to reform natural scenery, and force it, under all circumstances, to assume the form of clumps, belts, and serpentine canals. His architectural performances are less remarkable for their exterior than for their interior, and have been regarded as models of convenience and comfort.

BROWN, ROBERT, the founder of a religious sect first called *Brownists*, and afterwards *Independents*,

was born of an ancient family at Toilethorpe, in Rutlandshire, about 1550, and studied at Cambridge, whence, after graduating B.A. in 1572, he removed to London. Here he supported himself by teaching; but he soon returned to Cambridge, and began openly to attack the government and liturgy of the Church of England as anti-Christian. He first ascended the pulpit at Norwich in 1581, where he succeeded in converting a number of Dutch, who had a congregation there, to his opinions. For this he was brought before the ecclesiastical commissioners, to whom he behaved so rudely that he was sent to prison, but soon obtained a release. He then went to Middelburg, in Holland, with his followers, and wrote a book called *A Treatise of Reformation without Tarrying for any Man*. In 1586 he returned to England, and, as he still laboured to gain converts, he was excommunicated by the Bishop of Peterborough. This censure, joined perhaps with the evaporation of his zeal, induced him to submit, and in 1586 he became master of Stamford Grammar School, a post which he occupied till 1590, when he was presented to the living of a church in Northamptonshire. He died about 1633 in Northampton jail, where he had been sent for assaulting a constable and insulting a magistrate. The sect of Brownists, far from expiring with their founder, soon spread so as to become a subject of great alarm; and a bill was brought into Parliament which inflicted on them very severe pains and penalties. In process of time, however, the name Brownists was merged in that of Congregationalists, or Independents, under the latter of which titles they formed a powerful party in the Commonwealth.

BROWN, ROBERT, botanist, was born at Montrose, 21st December, 1773, and died in London, 10th June, 1858. He was the son of a Scotch Episcopalian clergyman, and received part of his education at Marischal College, Aberdeen, afterwards studying medicine at Edinburgh. He finished his education in 1795, when he became ensign and assistant surgeon in a Fifehire fencible regiment, which he accompanied to Ireland, remaining there till 1800. He was then, through the influence of Sir Joseph Banks, appointed naturalist to Captain Flinders' surveying expedition to Australia or New Holland. The whole continent of Australia was circumnavigated, the coast at various points examined, and Brown remained in the colony, visiting various parts of New South Wales and Van Diemen's Land, till 1805. He returned with nearly 4000 species of plants, was shortly after appointed librarian to the Linnean Society, and was now able to devote himself to the systematic study of his plants. He continued to make the result of his investigations known in communications to the Linnean and Royal Societies. One of his earliest papers was on a group of the family of plants named by Jussieu Apocynæ, which he succeeded in establishing as a separate family under the title already given them by Jussieu of Asclepiadæ. In 1810 he published the first volume of the great work he had been preparing on the plants of Australia and Tasmania, entitling it *Prodromus Floræ Novæ Hollandiæ et Insulæ Van Diemen*. No second volume of it ever appeared. He was the first English writer on botany who adopted the natural system of classification which has since entirely superseded that of Linneus, and it was carried out by him in a masterly manner. In 1814 he published a botanical appendix to Captain Flinders' account of his voyage, entitled *General Remarks, Geographical and Systematical, on the Botany of Terra Australis*. In 1828 he published a brief *Account of Microscopical Observations on the Particles contained in the Pollen of Plants, and on*

the General Existence of Active Molecules in Organic and Inorganic Bodies. He was the first to call attention to the presence of these active molecules. The movement of the granules of the fovilla (or semi-fluid matter contained in the pollen grains) which he believed to be purely physical, or non-organic, has on the Continent acquired the name of the Brownian or Brunonian movement. He also wrote botanical appendices for the voyages of Ross and Parry, the African exploration of Denham and Clapperton and others, and described, with Dr. Bennet, the plants collected by Dr. Horsfield in Java. In 1810 he received the charge of the collections and library of Sir Joseph Banks, which were afterwards bequeathed to him for life. He transferred them in 1827 to the British Museum, and was appointed keeper of botany in that institution. He became a fellow of the Royal Society in 1811, D.C.L. of Oxford in 1832, a foreign associate of the French Academy of Sciences in 1833. He had the Copley medal in 1839, and was appointed president of the Linnean Society in 1849. He also received the decoration of the highest Prussian order of civil merit, presided over by Baron Humboldt, who called him *Botanicorum facile princeps*. As a botanist Brown occupied the very highest rank. He powerfully promoted the natural system of plants, by making the microscope and the study of development the basis of his classification; and by his skill in the application of ascertained facts to the elucidation of obscure and the explanation of doubtful phenomena, he greatly advanced our scientific knowledge of the vegetable kingdom. His influence extended to other observers, and even to other departments of science. His works, contained chiefly in the Transactions of learned societies and other inaccessible forms, are not of a nature to be popular. A collection of them is well known in Germany; and many of his papers have also been printed in England by the Ray Society (1866-67, two vols.).

BROWN, DR. THOMAS, metaphysician, was the son of the Rev. Samuel Brown, minister of Kirkcubrecht, Kirkcudbrightshire, and was born there 9th Jan. 1778. He died at Brompton, near London, April 2, 1820. He attended schools in the neighbourhood of London, and subsequently studied at Edinburgh University, where he took a degree in medicine. Philosophy was his favourite study, however, and in 1810 he was appointed colleague of Professor Dugald Stewart, a position which he held for the rest of his life. He distinguished himself at a very early age by an acute review of the medical and physiological theories of Dr. Darwin, in a work entitled *Observations on Darwin's Zoonomia*, 8vo. This work introduced him to a literary society, of which Jeffrey, Brougham, Sydney Smith, &c., were members. It was this society which gave rise to the Edinburgh Review. Brown wrote on the philosophy of Kant in the second number, but being displeased with some liberties taken with one of his papers intended for the third number, his connection with the Review terminated. He also published some poems which displayed considerable talent, including the *Paradise of Coquette* (London, 1814). But he is noteworthy solely on account of his metaphysical speculations. His chief works are: *Inquiry into the Relation of Cause and Effect*, *Lectures on the Philosophy of the Human Mind*, and *Physiology of the Human Mind—an abstract of the Philosophy*. The system which he developed is characterized by great simplicity. He reduces the intellectual faculties to three great classes—perception, simple suggestion, and relative suggestion; employing the term suggestion as nearly synonymous with association: and thus he stripped the science of mind of that burden of in-

distinct which distinguished the school of Reid and Stewart. His classification of the affections, passions, and duties is perspicuous; and his development of the theory of cause and effect, first suggested by Hume, evinces the extent and ingenuity of his views. Although on some points an opponent of Hume, he leaned, as will be perceived, to the empirical or positivist school of philosophy, to which his lectures have been pronounced to be one of the best introductions.

BROWN COAL is a mineral nearly resembling coal, and formed like it of vegetable remains, but more woody or fibrous in its formation. It usually belongs to later formations than the common coal, and on this account has been called modern coal. Brown coal is at first hardly to be distinguished from common coal, but it has a brown streak when scratched, and when exposed to the air rapidly deteriorates, falling to powder in a few months, while the kind called lignite tears and splits. Brown coal contains much more water than common coal, and is thus less valuable as fuel. Where better fuel is scarce, however, it is largely used.

BROWNE, SIR THOMAS, a physician and very celebrated writer, was the son of a merchant of London, where he was born in 1606; died in October, 1682. He lost his father early, and was defrauded by one of his guardians; but his mother, who married Sir Thomas Dutton, had him educated at Winchester School, whence he was at a proper time removed to Oxford, where he took the degree of M.A. He practised as a physician for some time in Oxfordshire. He subsequently accompanied his father-in-law to Ireland, and afterwards visiting the Continent, received the degree of M.D. at Leyden. On his return to England he settled as a physician at Norwich, where he married and acquired extensive practice and reputation. In 1642 he published his famous work entitled *Religio Medici*, which excited the attention of the learned not only in England, but throughout Europe, and was translated into various languages. In 1646 his literary character was still further exalted by the appearance of his *Pseudodoxia Epidemica*, or *Treatise on Vulgar Errors*, a work of extraordinary learning, and accounted the most solid and useful of his literary labours. Owing probably to his extent of practice, it was not until 1658 that his *Hydriataphia*, or *Treatise on Urn-Burial*, appeared, conjointly with his *Garden of Cyrus*. These works ranked him very high as an antiquary; and he maintained a wide correspondence with the learned both at home and abroad. In 1666 he was constituted an honorary member of the College of Physicians, and in 1671 King Charles II., visiting Norwich, conferred on him the honour of knighthood with great marks of esteem. Of a most amiable private character, he was singularly happy in the affection of his large family and numerous friends; and passed through a remarkably tranquil and prosperous literary and professional life. The literary character of Sir Thomas Browne, as exhibited by his productions, was very remarkable. His *Religio Medici* is in no way professional, but may be described as the beliefs of an individual, upon morals, religion, and metaphysics. It is a curious production, and its extreme orthodoxy and submission to authority might in later days, at least in expression, be held ironical. He deems it 'no vulgar part of faith to believe a thing, not only above but contrary to reason, even against the arguments of our proper senses.' Fancy and feeling in fact predominated in him over judgment; he believed in the existence of guardian angels, in the reality of witchcraft, and the appearance of spectres. He was, however, extremely benevolent, opposed to persecution, and in the moral part of his work he frequently expatiates with a noble glow of language on subjects

of charity and philanthropy. This work was much attacked, both at home and abroad, especially by the German divines, who, *more theologically*, treated a writer as an atheist and an infidel whose piety and reverence for authority were displayed in every page. The *Treatise on Vulgar Errors* ably discusses the varying causes of error, which he examines with great strength of reasoning and liberality of sentiment. His appropriation of one grand source of error to the machinations of Satan, however, may not appear very philosophical at present; and of course his own sciences being only that of the day, he is often astray in the department of natural knowledge. Still he displays a large and penetrating understanding on many points, and this work still retains considerable celebrity. His treatise on *Urn-Burial*, composed on occasion of the discovery of some funeral urns in Norfolk, discovers some curious erudition on the subject of ancient and modern burial; and the tract called *The Garden of Cyrus* is still more curiously learned and fanciful. Sir Thomas Browne left some posthumous papers relative to antiquities, which appear in the folio edition of his works, published in 1686. Dr. Johnson, who has written his life, and who is thought in some degree to have founded his own style upon that of Sir Thomas Browne's, has given a masterly description of his genius and tone of composition; in which he speaks highly of the exuberance of his knowledge and plenitude of his ideas; and in reference to his heterogeneous mixture of languages, observes that he who has uncommon sentiments to deliver, may be allowed great liberty in his manner of expressing them. Coleridge has characterized Browne as 'rich in various knowledge, exuberant in conceptions and conceits, contemplative, imaginative; often truly great and magnificent in his style and diction, though doubtless too often big, stiff, and hyperlativistic.' His works have been republished in three vols. in Bohn's Antiquarian Library.

BROWNE, ULYSSES MAXIMILIAN, COUNT VON, one of the best generals of his time, was born at Basel in 1705; died June, 1757. His father was an Irishman who became colonel in the Austrian service. The son served from his early youth in the imperial army; distinguished himself in the Italian war, particularly in the battles of Parma and Guastalla; in 1739 was made lieutenant-field-marshal, took the command against Frederick II. in Silesia in 1740, and was defeated at Mollwitz in the following year. In 1746 he gained the battle of Piacenza against the French, took the Pass of Bochetta, and made himself master of Savona. In 1752 he was made governor of Prague, and commander-in-chief of the forces in Bohemia, and in 1756 was appointed field-marshal. He defeated Frederick II. at Lovowitz in 1756, and was wounded at Prague, where he served under Prince Charles of Lorraine, on 6th May, 1757.

BROWNE, WILLIAM, an English poet of considerable merit, was born at Tavistock in Devonshire in 1690; died about 1645. He was educated at Exeter College, Oxford, and thence removed to the Inner Temple, London. In his twenty-third year he published his *Britannia's Pastorals*, which met with great approbation; and in the following year appeared his *Shepherd's Pipe*, in seven eclogues. In 1618 he published the second part of his *Britannia's Pastorals*, which met with equal success with the former. In 1624 he returned to Exeter College, and became tutor to Robert Dormer, earl of Caernarvon, who was killed at the battle of Newbury. At Oxford Browne was created M.A., but upon again quitting the university he was taken into the family of William, earl of Pembroke. An edition of his works in three vols. was printed by Davies in 1772.

BROWNE, in the popular superstitions of Scot-

land, was a spirit who cleaned the house, churned, threshed, and did other good-natured offices. He seems to be the same as the English punk, hobgoblin, or Robin Goodfellow.

BROWNING, ELIZABETH BARRETT, a distinguished female poet, regarded by some as the greatest which England has ever produced, was born in London in 1806. Her father, Mr. Barrett, was a country gentleman who resided at the foot of the Malvern Hills, and in this beautiful retreat his daughter's girlhood was passed. She early began to commit her thoughts to writing, and in 1826 a volume, entitled *An Essay on Mind*, with other Poems, appeared of her authorship. Viewed as the production of a young lady of sixteen, this volume is indeed a remarkable one; but in after years its authoress was so dissatisfied with it that she omitted it in the collected editions of her poems. In 1833 appeared a translation by her of the *Prometheus Vinctus* of Æschylus, and in 1836 the *Romance of Margret*, which was published anonymously in the *New Monthly Magazine*, and created by its originality a considerable sensation. A collection, entitled *The Seraphim*, and other Poems, was produced in 1838, the principal piece being a lyric drama shadowing forth the feelings and emotions which may be supposed to have been excited in an angelic being by the spectacle of the crucifixion. Both in this and in a subsequent work, *The Drama of Exile* (1840), she has chosen for her theme the fall and redemption of man, subjects on which Milton had already employed his genius, and in the treatment of which, though exhibiting much grandeur and sublimity, Mrs. Browning can scarcely be said to have approached our great English poet. Always feeble in health, she was now nearly brought to the verge of the grave by the rupture of a blood-vessel, and having been taken to Devonshire to promote her recovery, received there a severe shock by the death by drowning of a favourite brother. For several years she was confined to a darkened chamber, and saw only a few of her most intimate friends, but nevertheless continued to busy herself with study and composition. Her health was at length partially restored, and in 1846 she was married to Mr. Robert Browning, a gentleman well known in the literary world as a poet and dramatist. After their union they went abroad to Italy, and continued subsequently to reside for the most part in the city of Florence. In 1850 a collected edition of Mrs. Browning's works appeared in two volumes, including several new poems, and among others *Lady Geraldine's Courtship*, one of the finest of her productions, and remarkable, it is said, as having been composed in the incredibly short space of twelve hours. *Casa Guidi Windows*, a poem on the struggles of the Italians for liberty in 1848-49, appeared in 1851. The longest and most finished of all her works, *Aurora Leigh*, a narrative and didactic poem in nine books, was published in 1856. Her last volume, *Poems before Congress*, appeared in 1860, and cannot be said to have added greatly to her reputation. Several detached pieces from her pen appeared from time to time in the *Cornhill Magazine* up to the period of her death. She expired at Florence on 29th June, 1861. The poetry of Mrs. Browning is characterized by much pathos and depth of feeling, combined with great vividness and powers of description. It partakes eminently of the modern English school, as represented by Tennyson and others, at times obscure and transcendental, but animated throughout by the most noble and exalted sentiments, and illuminated from time to time by flashes, which, in their bearings on the unseen world of mind and spirit, seem almost supernatural.

BROWNING, ROBERT, one of the greatest of the

Victorian poets, was born at Camperdown 7th May, 1812, and died at Venice 12th Dec. 1889. His father, who was a clerk in a bank, had the boy educated in a school at Peckham, after which he attended lectures at University College. At the age of twenty he travelled on the Continent and resided for some time in Italy, where he made diligent study of its mediæval history. About this time (1833) he published his first poem of *Pauline*; spent some months in Russia in 1834; and in the following year issued *Paracelsus*, a dramatic poem in five parts. In 1837, at the suggestion of Macready, he wrote the *Tragedy of Strafford*, which was produced at Covent Garden in May of the same year with no marked success. His next poem, *Sordello*, was printed in 1840, and the obscurity of its introspective subtleties injured the poet's reputation with the critics. This notwithstanding, he published (1841-46) the *Bell and Pomegranates* series, in which were included the three plays *Pippa Passes*, *King Victor and King Charles*, and *Colombe's Birthday*; the four tragedies *The Return of the Druses*, *A Blot on the Scutcheon* (produced by Macready at Drury Lane in 1843), *Luria*, and *A Soul's Tragedy*; while among the lyrics were the *Pied Piper of Hamelin*, *How they Brought the Good News from Ghent to Aix*, and *The Lost Leader*. In 1846 he married the poetess Elizabeth Barrett (see above), and settled with her in Florence, where they remained for nearly fifteen years. During his residence there he published *Christmas Eve and Easter Day* (1850), and *Men and Women* (1855), the latter containing such characteristic poems as *Andrea del Sarto*, *Fra Lippo*, *Childe Roland*, *Evelyn Hope*, *One Word More*, and *Up at a Villa*. When the poet's wife died in 1861 he returned to London, and entered upon his richest literary period by publishing *Dramatis Personæ* (1864). These dramatic monologues, of which there were seventeen, include *Rabbi ben Ezra*, *Abt Vogler*, *Prosperio*, *Caliban upon Setebos*, and *A Death in the Desert*. Recognition of his literary fame, which came slowly, was made in 1867, when he was elected an honorary fellow of Balliol, an M.A. of Oxford, and later *agr. LL.D.* of Cambridge. It was not, however, until 1869, that *The Ring and the Book* was published, and this poem, which accentuates every characteristic of the poet, still remains his central achievement. The poem, which is epical in length if not in method, is the story of a murder told ten times over in wide variety of intention by various persons connected with the tragedy. His next publication was the short poem of *Hervé Riel*, the proceeds from which were devoted to the relief of Paris after the siege in 1871. Following this came *Balaustion's Adventure* (1871), including a translation of Euripides' *Alceste*; *Prince Hohenstiel-Schwangau, Saviour of Society* (1871), an imaginary conception of how Louis Napoleon might justify his policy; *Flüke at the Fair* (1872), in which the relations of the sexes are discussed; *Red-Cotton Night-Cap Country* (1873), a story of love, penitence, and suicide, the scene of which is laid in Normandy; *Aristophanes' Apology* (1875); *The Inn Album* (1876), a story of a woman's wrongs; *Pacchiarotto*, and how he Worked in Dismember (1876), in which the author deals incidentally with his own method in the poetic art; *The Agamemnon of Æschylus* (1877); and *La Salsiz* (1878), in which immortality is discussed. As a kind of new departure he published a first set of *Dramatic Idylls* (1879), and a second series (1880), of which the more important are *Martin Relp*, *Phædipides*, *Ivan Ivanovitch* and *Echelos*. The volumes which have followed are *Jocoseria* (1883); *Ferishtah's Fancies* (1884); *Parleyings with Certain People of Importance in their Day* (1887); and *Asolando* (1889). The latter volume was pub-

lashed when the author was on his death-bed, and an account of its favourable reception was almost the last information he received. His body was brought from Venice to England, where, in national recognition of his genius, it was buried in Westminster Abbey between Cowley and Chaucer. In such fashion and in ungrudging completeness was his poetic greatness acknowledged at the last. Its too tardy recognition by the popular voice was largely due to the prevailing belief that poetry is for the mental dalliance of a lazy hour, and also to the persistency with which Browning had mocked at this belief in the athletic hardness of mind which he required in his readers. Moreover he seemed always inclined, to the dismay of the public, to press forward into service the superficial defects of his solid interior qualities. Thus, at times, his wide scholarship strayed off into pedantry; his secure skill in verse dropped ever and again into grotesque Bohemian robustness of phrase and rhyme; his swift intuitive glance into the problems of life seemed to create in him an artistic impatience of detail which, in the structure of his verse, became a thrifty brusqueness of expression tending towards cypher; and, above all, his most notable gift of analysis, his power to track the most hidden motive to its last retreat, seemed ever inclined to lapse into an introspective subtlety akin to the cobwebberies of the schoolmen. Yet, aside from these occasional shortcomings, there remain his learning, his humour, his mastery of artistic expression, his immense range of sympathy, his spiritual insight, and the height and strength of his ideals to make him one of the greatest of modern poets.

BROWNISTS, the name given for some time to those who were afterwards known in England and Holland under the denomination of Independents, so called from Robert Brown, a notice of whose life is given in a previous page. See INDEPENDENTS.

BRU, MOSES VINCENT, a Spanish painter, born at Valencia in 1682, studied under Juan Conchillos, an able master, and soon outstripped all his fellow-students. When very young he was employed to execute three paintings for a church of his native town. They are highly praised by Palomino Velasco. The great hopes of future excellence which they raised were disappointed by his premature death in 1703, at the age of twenty-one.

BRUCE, JAMES, a celebrated African traveller, was born at Kinnaid House, Stirlingshire, in 1780; died in April, 1794. He received his early education at Harrow, whence he removed to the University of Edinburgh, and studied for the law. He left Scotland in 1783 with a view to apply for enrolment in the service of the East India Company as a writer, but falling in with the daughter of a London wine merchant named Allan, he married her, and entered into partnership with her father. A few months after their marriage his wife exhibited symptoms of consumption, and he proposed to remove with her to the S. of France, but she died at Paris in the way. He endeavoured to console himself by the study of languages, and availed himself of the opportunities of his trade to visit Spain, Portugal, and the Netherlands. On his return he visited France, where he made some stay, Germany, and the Netherlands. This journey was marked by two uncommon incidents. He fought a duel, and witnessed the battle of Crefeld. In 1768 he inherited his father's estate, the income of which was soon after greatly increased by the establishment of the Carron Iron-works, and the utilization of its coal-mines. He consequently relinquished the wine trade in 1761. During his journey to Spain he had been struck with the defenceless state of Ferrol, and on the breaking out of war he proposed, in an interview

with Pitt, a descent on it, for which preparations were actually made by the succeeding government. This project was abandoned, but Lord Halifax, appreciating Bruce's character, proposed to him shortly after a career of geographical discovery, in which he promised him his protection and support. He pointed specially to the exploration of the coast of Barbary, in completion of the labours of Shaw, and hinted also at the discovery of the sources of the Nile. In the meantime Halifax offered him the consulship of Algiers, which he accepted, and sailed from England in June, 1762, passing through France and Italy. His consulship lasted for two years, and on its expiry in 1765 he visited successively Tunis, Tripoli, Rhodes, Cyprus, Syria, and several parts of Asia Minor, where, accompanied by an able Italian draughtsman, he made drawings of the ruins of Palmyra, Baalbec, and other remains of antiquity. Having now formed his plan for visiting Abyssinia, he set out for Cairo in June, 1768, after about a year spent in Syria, navigated the Nile to Syene, crossed the desert to the Red Sea, passed some months in Arabia Felix, and reached Gondar, the capital of Abyssinia, in February, 1770. On November 14, 1770, he succeeded in reaching the sources of the Abai, which was then considered the main stream of the Nile. On his return in 1778 he embarked at Alexandria for Marseilles, and remained for some time in France, where Buffon and other distinguished men received him with marked attention. After visiting Italy, he returned to Scotland in 1774, and in 1776 married Mary, daughter of Thomas Dundas of Fingask, by whom he had two sons and one daughter. She died in 1785. His long-expected travels did not appear until 1790, in five large quarto volumes, decorated with plates. The authority of the work, in regard to facts of natural history and human manners, was questioned on its first appearance; and Bruce, during the few remaining years of his life, felt keenly the incredulity of the public. The truth of his descriptions, however, has been amply confirmed by travellers who have visited the same regions. This enterprising traveller lost his life in consequence of an accidental fall down stairs.

BRUCE, MICHAEL, one among the minor British poets, distinguished for the plaintive elegance of his compositions. He was born at Kinnesswood, in Kinross-shire, Scotland, in 1746; and, his friends being persons in low circumstances, he had to struggle with poverty, which, together with constitutional disease, gave a melancholy turn to his mind, and influenced the character of his writings. For a short time he was engaged in the occupation of a village schoolmaster, the fatigues of which probably shortened his life. He became consumptive, and died in 1767. His poems, which are few in number, were published by the Rev John Logan, together with some of his own, at Edinburgh in 1770. One, composed in anticipation of his own death, is peculiarly affecting.

BRUCE, ROBERT (ROBERT DE BRAUS), fifth lord of Annandale, born 1210; died at Lochmaben Castle, 1295. He was possessed of extensive estates in Cumberland, for which he did homage to Henry III., and in 1255 he was made sheriff of Cumberland. He was appointed one of the fifteen regents of the kingdom of Scotland during the minority of Alexander III. He commanded, along with Comyn and Ballok, the Scottish auxiliaries of Henry III. at the battle of Lewes (1264), where he was taken prisoner, and released in 1265. He was one of the competitors for the Scottish crown on the death of Margaret, the maiden of Norway, in 1290, being the grandson of David, earl of Huntingdon, by his second daughter Isobel, while Ballok claimed as the great-grandson of

the eldest daughter Margaret. On the decision of Edward being given in 1293 in favour of Balliol, Bruce resigned the estate of Annandale to his eldest son to avoid doing homage to him.

BRUCE, ROBERT DR, Earl of Carrick, eldest son of the preceding, accompanied Edward I. to Palestine in 1269; married on his return, in 1271, Martha Margaret, countess of Carrick. Like his father he resigned the lordship of Annandale to his eldest son to avoid acknowledging the supremacy of Balliol. When the latter renounced the authority of Edward, he fought on the side of the English, and after the battle of Dunbar he made application to Edward, unsuccessfully, for the crown.

BRUCE, ROBERT, the most heroic as well as the most patriotic monarch whom Scotland ever produced, was born on the 21st of March, 1274. He was the son of the preceding. Seven years of alternate resistance and submission, of wars and truces, had passed, from the battle of Falkirk, when Edward I. returned to London, in 1305, victorious for the third time over Scotland, and delivered by treachery from the dreaded Wallace. In his train, among other Scottish nobles, were Robert Bruce and John Comyn, who, formerly rivals, now combined to deliver themselves from the perfidious Edward. They agreed that Bruce should be declared king, and that Scotland should be summoned to arms. Comyn betrayed his accomplice, who, without being informed of the discovery of the plot, was ordered not to leave the court. He received the first intimation of his danger by the present of a pair of spurs and a purse of gold from one of his friends; and understanding the hint, he had his horses shod with their shoes inverted, that the traces on the snow might baffle his pursuers, and escaped to Scotland. He immediately assembled his friends at Dumfries, and all the nobles, except Comyn, encouraged his resolution, and promised their aid. Comyn endeavoured to dissuade them from so desperate an undertaking; and after the assembly was dismissed, he was attacked by Bruce in the cloisters of the Gray Friars, and run through the body. Bruce was soon after crowned at Scone. Being twice defeated, he dismissed his troops, and retired to the Hebrides, accompanied only by two friends. His wife was carried captive to London, three of his brothers were slain, and he himself was supposed to be dead, when he reappeared in Scotland, collected an army, put to the sword the English garrisons, and rallied all Scotland under his banners. Edward set out to subdue the Scots, and was on the point of entering the kingdom, vowing revenge, and secure of success, when he sickened and died, enjoining it with his last breath on his successor never to desist till he had subjected all Scotland. Bruce defeated the English at Bannockburn, near Stirling, and secured the independence of his crown, June 24, 1314. The distracted state of the country required vigorous measures. The Scottish nobles had encroached on the possessions of the king and the commons. The king called upon them to show the titles by which they held their lands. 'By these,' they exclaimed, drawing their swords, 'we have acquired our lands, and with these we will preserve them!' King Robert was once more obliged to defend his territories from the English, who, encouraged by these disputes, had again passed the Scottish borders. The English king, being compelled to retire, was defeated by Bruce near Byland Abbey, Yorkshire (1328). On the accession of Edward III., 1327, hostilities were recommenced, but the Scots were again victorious, and a treaty was concluded at Northampton, March 4, 1328, which recognized the independence of Scotland. Bruce died in the course of the next year. Under the article SCOTLAND a more extended view will be taken of the transactions of

this heroic prince, as they all belong to the most memorable and glorious period of Scottish history.

BRUCHSAL, a town of Baden, on both sides of the Salzbach, 12 miles N.W. from Carlsruhe, now an important railway centre. It is an ancient town, was a common residence of the prince-bishops of Spire from the twelfth century, and the residence formerly occupied by them is still standing. This is a building in the rococo style, erected in 1720-70, and in connection with it is a fine garden with fountains. The church of St. Peter's, in which the prince-bishops were buried, is an interesting edifice. Soap, paper, cigars, &c., are made. Pop. in 1900, 13,567.

BRUCINE, an alkaloid discovered in 1819, and obtained in the preparation of strychnine, from which it is separated by boiling alcohol. It crystallizes in white and transparent prisms, with a rhomboidal base. It has a very bitter taste, but no smell, and is less poisonous than strychnine. It is insoluble in ether, and dissolves in a mixture of 850 parts of cold and 500 parts of boiling water. Nitric acid gives it a scarlet, and sulphuric acid a rosy tint, but both turn gradually to yellow. A solution of copper turns it to violet. These reactions distinguish brucine both from strychnine and morphine. The salts of brucine are tolerably numerous, and are prepared by double decomposition, or by direct combination of the brucine with the acid. They are for the most part crystallizable, and like the base have a bitter taste. They are not used in medicine.

BRUCIOLI, or BRUGIOLI, ANTONIO, born at Florence in the end of the fifteenth century, early displayed great talent, and was one of the learned Florentines who used to meet in the fine gardens of Bernard Rucellai. In 1522, having become implicated in a conspiracy against Giulio di Medici, who then governed Florence in the name of Leo X., he took refuge in France, where he became acquainted with the doctrines of the reformers, and probably embraced them. On the expulsion of the Medici in 1537 he returned to Florence, but, by his free declamation against monks and clergy, brought his orthodoxy in question, and was imprisoned on several charges, among which that of heresy was included. He would have been executed but for the interference of powerful friends, who obtained a commutation of his sentence into banishment for two years. He retired to Venice with two brothers, who were printers, and availed himself of their press to publish a great number of works, of which the most celebrated is a translation of the Bible into Tuscan. The first edition appeared in folio in 1532, and was dedicated to King Francis I., who is said to have taken no notice of it. The boldness of his annotations caused it to be ranked as a heretical work. He afterwards published it with a larger commentary, in three vols. folio (Venice, 1546-48). This edition is now very scarce. It is said to contain many inaccuracies; and though professedly made from the original Hebrew and Greek, appears to be taken, for the greater part, from the Latin version of Pagnini. Brucioli was living in 1554, but the exact date of his death is not known. The number of his volumes is said to have exceeded that of his years. Among his works are Italian translations of Pliny, Aristotle, and Cicero, and annotated editions of Petrarca and Boccaccio.

BRUCKER, JOHN JAMES, distinguished for his learning, was born at Angsburg in 1694, studied at Jena, and after occupying several subordinate situations, was appointed minister in his native town. His attention had been early directed to the history of philosophy, and he gradually accumulated the materials of the great work on which his fame now rests. It is entitled *Historia Critica Philosophiæ, a Mundi Incunabulis ad Nostram usque Aetatem Deducta*, and

was ~~first~~ published in 1744, in five vols. 4to, which were afterwards augmented by a supplementary sixth volume. Brucker died at Augsburg in 1770.

BRUGES (or **BRUYS**) **D'AIGAILLIERS**, **FRANÇOIS PAUL**, a French admiral, born of an ancient noble family at Uzès on Feb. 11th, 1758, entered the navy at an early age, and gradually rose in the service. In 1798 he was employed to convey Bonaparte and his army, which were to effect the conquest of Egypt and the East, and having managed to elude the vigilance of Nelson, who had been long watching for him, reached the Bay of Aboukir, and disembarked the troops in safety. Bruels moored his fleet in a position naturally so strong that he deemed it impregnable; but by the heroic daring of Nelson, he found the precautions which he had taken turned to his disadvantage. In the battle which ensued, he fell fighting boldly, a little before his ship, the *Orient*, of 100 guns, blew up. See **ABOUKIR**.

BRUGES (Flemish, *Brugge*), a city of Belgium, capital of West Flanders, situated about 60 miles n.w. of Brussels, about 8 miles from the sea, surrounded and intersected by canals which connect it with Ostend and other places. By these canals fairly large vessels can reach Bruges; and a ship canal to connect it with the sea at Heyst has been begun. Bruges has over fifty bridges, all opening in the middle for the passage of vessels. The Halles (containing cloth and other markets) is a fine old building, with a famous belfry or tower 350 feet high, in which is a fine carillon of forty-eight bells. Bruges has also an elegant Gothic town-hall dating from the fourteenth century; a palace of justice, noted for a magnificently adorned fireplace; an academy of painting, sculpture, and architecture; a public library, &c., and many valuable specimens of architecture and sculpture. In the Church of Notre Dame, with its spire 290 feet high, are the splendid tombs of Charles the Bold and of Mary of Burgundy, his daughter, constructed in 1550, besides many other artistic treasures. The cathedral dates from the thirteenth and fourteenth centuries, and is unattractive externally but has a fine interior, and there are other notable churches. Philip the Good here founded the order of the Golden Fleece in 1430; and the celebrated Jan Van Eyck, or John of Bruges, the supposed inventor of painting in oil, was born here. Bruges was long the residence of the Counts of Flanders. It was fortified by Count Baldwin in 837, walled first in 1058, and again in 1270. In the thirteenth and fourteenth century it was one of the chief commercial places in Europe. Towards the end of the fifteenth century it began to decline. It was nearly ruined by the oppressions of the Duke of Alva. The remains of ancient buildings, abandoned monasteries, and streets half deserted from the diminished population of the modern city, give Bruges an antiquated and venerable appearance. Many of the houses are very old, but in a state of excellent preservation. Bruges is still, by means of its canals, an entrepôt of Belgian commerce. The chief articles manufactured here are lace, linen, damasks, light woollen goods, cottons, mixed stuffs, beer, &c. Bruges exports agricultural produce and manufactured goods, and imports wine, oil, colonial produce, &c. Pop. (1896), 51,217.

BRUGSCH, **HEINRICH KARL**, German Egyptologist, was born at Berlin on Feb. 18th, 1827. A work entitled *Scriptura Aegyptiorum Demotica*, published in 1848, gained him the favour of Alexander von Humboldt and Frederick William IV., the latter of whom enabled him to complete his studies by visiting the museums of Paris, London, Turin, and Leyden. In 1858 he made his first visit to Egypt and assisted Mariette in his researches, being appointed

on his return in the following year assistant in the Berlin Egyptian Museum. He accompanied the Prussian embassy to Persia in 1860, and four years later became consul at Cairo. Returning in 1868, he was appointed to the chair of Egyptology at Göttingen, but two years afterwards he resigned in order to accept the invitation of the Egyptian sovereign to take charge of the Cairo School of Egyptology. He was soon raised to the rank of bey, and some time afterwards to that of pasha. In 1888 he travelled in Egypt, Syria, Greece, and Italy with Prince Frederick Charles of Prussia, and in 1895–86 he twice visited Persia, partly on official business. He was again in Egypt in 1891, and in the following year he made a journey to the Libyan desert. He died at Charlottenburg on Sept. 9th, 1894. Brugsch's chief work is the *Hieroglyphisch-demotisches Wörterbuch* (7 vols., 1867–82). His other writings include *Reiseberichte aus Ägypten* (1855); *Grammaire Démotique* (1855); *Monuments de l'Égypte* (1857); *Géographie des Inscriptions alt-égyptiennes Denkmäler* (3 vols., 1857–60); *Histoire d'Égypte* (1859); *Recueil des Monuments Égyptiens* (1862–85); *Reise der königlich Preussischer Gesandtschaft nach Persien* (1862–63); *Hieroglyphische Grammatik* (1872); *Geschichte Ägyptens unter den Pharaonen* (1877); *Dictionnaire Géographique de l'antenne Égypte* (1877–80); *Religion und Mythologie der alten Ägypter, nach den Denkmälern* (1888); *Thesaurus Inscriptionum Aegyptiacarum* (1883–91); *Die Ägyptologie* (1890); *Aus dem Morgenlande, Altes und Neues* (1893); &c. His History of Egypt from the Monuments has appeared in English. In 1894 his autobiography appeared under the title *Mein Leben und Wandern*.

BRÜHL, **HEINRICH CONRAT VON**, minister and favourite of Frederick Augustus II. (otherwise called Augustus III.), king of Poland and elector of Saxony, was born in 1700 in Thuringia, and entered as a page the service of the Duchess Elizabeth, whose favour as well as that of Frederick Augustus I. he gained by his lively and graceful manners. On the death of the king at Warsaw in 1733, the crown of Poland with the other regalia being, through the good fortune of Brühl, intrusted to him, he carried them immediately to the new elector, Augustus III., and showed the greatest activity in promoting his election. From this time fortune never deserted him. He had cunning and skill sufficient to govern his master and get rid of his rivals. While he felt himself not sufficiently powerful to remove his rival, Count Sulkowski, he acted as his friend; but after his marriage with the Countess Kollowrat, the favourite of the queen, he effected the dismissal of Sulkowski through her influence. He now succeeded in keeping everybody at a distance from the king. No servant entered his service without the consent of Brühl, and even when he went to the chapel all approach to him was prevented. Brühl kept 200 domestics; his guards were better paid than those of the king himself, and his table more sumptuous. Frederick II. says of him, 'Brühl had more garments, watches, laces, boots, shoes, and slippers, than any man of the age. Caesar would have counted him among those curled and perfumed heads which he did not fear;' but Augustus III. was no Caesar. When this idle prince loitered about smoking, and asked, without looking at his favourite, 'Brühl, have I any money?' 'Yes, sire,' was the continual answer; and to satisfy the king's demands he exhausted the state, plunged the country into debts, and greatly reduced the army. At the beginning of the Seven Years' War it comprised but 17,000 men, and these were compelled to surrender at Pirna from want of the necessary supplies. Brühl fled with the king, the

pictures, and the china, to Poland; but the archives of the state were left to the victor. He was no less avaricious of titles and money than of power. He died a few weeks after his king in 1768. An examination after his death showed that he owed his immense fortune to the prodigality of the king rather than to unlawful means of accumulation. His own profusion was often beneficial to the arts and sciences.

BRUMAIRE, the 18th, of the year VIII. in the calendar of the French revolution (Nov. 9, 1799): On this day General Bonaparte overthrew the Directory. The next day he dispersed at the point of the bayonet the Council of Five Hundred, and was elected consul.

BRUMMEL, **GEORGE BRYAN**, generally known by the sobriquet of *Beau Brummel*, was the son of a clerk in the treasury, and born in London in 1778. He was educated at Eton, and subsequently at Oxford, at both of which places he acquired great distinction by his taste in dress, which afterwards made him the autocrat in the world of fashion. At the age of sixteen he casually made the acquaintance of the Prince of Wales, afterwards George IV., who conceived a wonderful fancy for him, and made him a cornet in his own regiment of the 10th Hussars. Brummel was now introduced into the most aristocratic society in England, and through the favour of the prince had rapid promotion in the army, though his carelessness was such that he often did not know his own troop. The death of his father in 1794 put him in possession of a fortune of £30,000, which he expended in a course of sumptuous living, extending over a period of twenty-one years, during which his dicta on matters of etiquette and dress, and more especially the latter, were received in the *beau monde* as indisputable. He kept a magnificent bachelor establishment at the west end, gave splendid dinners, and basked in all the sunshine that youth, money, and princely favour could bestow. But these golden days must come to an end. The fickle temper of the prince-regent at last got tired of Brummel, and an estrangement took place. A well-known story is told in connection with this rupture, that Brummel, having called out at Carlton House, 'Wales! ring the bell,' the prince complied, and on the servant making his appearance, said, 'Order Mr. Brummel's carriage.' This story was always denied by Brummel. The *beau's* creditors, too, now began to be clamorous, and in 1814 he made a hasty journey to Dover, and crossed the Channel to Calais, where he resided for many years, partly supported by the remains of his own fortune and partly by remittances from friends in England. In 1824, when George IV. passed through Calais on his way to Hanover, Brummel ventured again to address himself to him, but was unceremoniously repulsed. Subsequently to this, he was appointed consul at Caen, but after holding this office for a few years, it was abolished as unnecessary, and he was reduced to absolute poverty. His mind, too, latterly gave way, and he died miserably in a lunatic asylum at Caen on 29th March, 1840.

BRUN, or **BRUNN**, **MALTE-CONRAD**, generally known by the name of *Malte-Brun*, a celebrated geographer, was a native of Denmark, and born at Thisted, in the province of Jutland, on the 12th of August, 1776. His father, who held an important office under government, presented him for the church, but the imaginative temperament of his son ill accorded with such a destiny. While yet a very young man he produced some poems which gave great promise of his rising to eminence in the domain of the Muses. About this time, however, the French revolution called forth a host of ardent champions of the cause of progress throughout Europe, and the young poet embraced it with enthusiasm. He abandoned the

church for the bar, and subsequently became the editor successively of two journals, in which his advocacy of liberal principles provoked a state prosecution that compelled him to take refuge in the Swedish island of Hven, once the residence of Tycho Brahe. From this he shortly afterwards received permission to return to Copenhagen; but some fresh attacks on government again made him an exile from his country, and he retired first to Sweden and then to Hamburg, where a wealthy merchant intrusted him with the education of his children. Not long after, his admiration of Napoleon Bonaparte, then rapidly advancing to the head of affairs, prompted him to take up his abode in France; but the elevation of his idol to the post of consul for life opened Brun's eyes to his ambitious designs. He had the courage openly to blame the weakness of the senate in yielding to them, and for the time withdrew from the pursuit of politics. A new sphere of study now engaged his attention, which was henceforth directed to the science of geography. In 1802, he published, along with Mentelle and Herbin, the commencement of *Géographie Mathématique, Physique et Politique, de toutes les Parties du Monde*, a work which was completed in sixteen volumes in 1807, and in the composition of which Brun's share amounted to about a third. Before the completion of this work his reputation as a writer, resting on his vivid description of the northern countries with which he was familiar; on his style, which was equal to that of the most eloquent French writers; and on the introduction of a new method of treating geography, which in the hands of previous French geographers had been a mere compilation of dry details, had been firmly established, and in 1806 he received an appointment on the staff of the *Journal des Débats*, for which he continued to write articles on foreign politics until his death. In 1808 appeared his *Tableau de la Pologne*, and the same year he joined M. Eyries in starting the *Annales des Voyages, de la Géographie et de l'Histoire*, which proved the introduction in France of regular periodical geographical literature. In 1810 was published the first volume of his *Précis de la Géographie Universelle*, completed in eight volumes in 1829, and re-issued in twelve volumes in 1831. During the Hundred Days Brun adhered to the legitimist cause, and published an *Apologie de Louis XVIII.* Towards the end of 1821 he lent powerful assistance in establishing the *Société de Géographie*. His health, however, had long been declining from his intense and unintermitting labours, and on the 14th December, 1828, he breathed his last. Besides the works already mentioned, he was the author of various geographical and political treatises too numerous to particularize.

BRUNCK, **RICHARD FRANZ PHILIPP**, one of the most ingenious critics of modern times, was born at Strasburg in 1729, and made rapid progress in learning when he studied with the Jesuits in Paris, but neglected study as soon as he entered into active life. While in winter-quarters at Giessen, as commissary of war during the French campaigns, he resided with a professor who, by his advice and example, revived his love of letters, and led him to the study of the classics. When Brunck returned to Strasburg he devoted all his leisure time to Greek, and at the age of thirty years, and while holding a public office, attended the lectures of the Greek professor of the university. The zeal which had encouraged him to undertake this laborious study was increased by the pleasure of overcoming difficulties, and he became fixed in the conviction that all the instances of apparently careless writing in the Greek poets were only errors of the transcribers. Entertaining this opinion, he altered whatever displeased

him, overthrew the order of the verses, and permitted himself liberties which criticism must needs reject. To this rage of altering he gave himself up, particularly in the marginal comments of his books, and in the numerous copies which he made of the Greek poets, more for his own pleasure than for use. This arbitrary process was so visible, even in the editions he has published, that much caution is required in using them. Brunk has nevertheless been of essential service to Greek literature, and since the revival of letters few scholars have so effectually promoted it. It is wonderful how much he has done in the space of twenty years. He published a valuable edition of Virgil. Of his Greek editions we may mention those of the *Analecta*, Apollonius Rhodius, Aristophanes, the *Gnomic poets*, and his masterpiece Sophocles, for which the king allowed him a pension of 2000 francs. At this time the French revolution interrupted his studies. He adopted the new ideas with enthusiasm, and was one of the first members of the popular society in Strasburg, without deviating, however, from the principles of moderation. This is proved by the circumstance that he was arrested at Besançon during the Reign of Terror, and did not obtain his liberty until after the death of Robespierre. In 1791 economical reasons obliged him to sell part of his library, and in 1801 he was obliged to adopt the same resource a second time. As he was passionately fond of his books, and his former fortune had enabled him to collect an excellent library, this was a severe privation. If he was reminded of an author he had once possessed tears came into his eyes. From this time Greek became his aversion; but he prepared an edition of Terence, and had Plautus ready for publication when he died in 1803. Many of the papers which he left are in the library at Paris.

BRUNDISIUM. See BRINDISI.

BRUNE, GUILLAUME MARIE ANNE, Marshal of France, son of a lawyer at Brives la Gaillarde, was born there March 13, 1768, and went while young to Paris to study law. At the breaking out of the revolution he was a printer, and had made himself known by some small pieces of his own composition. He now devoted himself ardently to politics, became a member of the club *des Cordeliers*, was connected with Danton, and played an active part in the tempests of that period. Till August 10, 1792, he was engaged in publishing a daily newspaper. Afterwards he went as civil commissary to Belgium. In 1793 he entered the military service in the revolutionary army in the Gironde. October 10, 1795, he aided Barras to put down the Jacobins, who had assaulted the camp of Grenelle. Afterwards he distinguished himself as general of brigade in the Italian army, in the battle of Arcola, and in the attack on Verona. When the directory of Switzerland declared war Brune received the chief command of an army, entered the country without much opposition in January, 1798, and effected a new organization of the government. In 1799 he received the chief command in Holland, defeated the British in the N. of Holland, September 19, near Bergen, and compelled the Duke of York to agree to the treaty of Alkmaar, October 18, by which the British and Russians were to evacuate the N. of Holland. In January, 1800, he was made a councillor of state, and was placed at the head of the army of the west, in occupation of La Vendée, and contributed greatly to the re-establishment of tranquillity in the revolted provinces. Aug. 13 he was appointed commander-in-chief of the Italian army. Towards the end of Dec. he led his troops over the Mincio, conquered the Austrians, passed the Adige Jan. 8, 1801, took possession of Vienna and Rovereto, and concluded an armistice, Jan. 16, at

Trieste, with the Austrian general Bellegarde, by which several fortified places in Italy were surrendered to the French troops. When peace recalled him to the council of state towards the end of November, 1802, he laid before the legislative body for confirmation the treaty of peace with the court of Naples. The next year he went as ambassador to the court of Constantinople. He prevailed there at first over the British party, and received from the Turkish ministry the highest marks of honour; but when new dissensions arose between the two powers he left Turkey. During his absence, May 19, 1804, he was appointed marshal of the empire. At the end of 1805 Napoleon appointed him governor-general of the Hanseatic towns, and soon after commander of the troops in Swedish Pomerania, against the King of Sweden. This monarch invited the marshal to a personal interview, in which he endeavoured to convert him to the cause of Louis XVIII. Brune refused every proposal. He may, however, have drawn upon himself the indignation of Napoleon by his conduct in this interview, or by favouring the British contraband trade in Hamburg. At any rate he was recalled, and suffered to remain without employment. After the revolution of 1814 he acknowledged Louis XVIII., and received the cross of Louis, but no appointment. This was the cause of his declaring himself for Napoleon immediately upon his return. He received the chief command of an important army in the S. of France, and was made a peer. When circumstances changed again he delayed a long time before he gave up Toulon, which was in his possession in 1815, to the troops of Louis XVIII., and sent in his resignation to the king. This circumstance, and the severities exercised by his command, might well have excited against him the rage of the people. While retiring from Toulon to Paris he was recognized at Avignon by the people who favoured the king, and they immediately collected together about the hotel which he had entered. The excited populace were roused still more when a report was spread among them that Brune was the murderer of the Princess Lamballe. The marshal was permitted, however, to go away quietly. But scarcely had his carriage left the city before a mob of the rabble which had followed compelled the driver to turn back to the hotel. When the marshal had alighted, and retired with his two adjutants to his former chamber, the doors of the house were locked. The insurgents had, in the meantime, gained a powerful accession to their numbers, and with loud shouts demanded the death of the marshal. In vain did the prefect and the mayor strive to defend him (as there were no troops in the city) for the space of four hours and a half, at the peril of their lives. The door was at last broken open, a crowd of murderers rushed into the chamber, and the unhappy marshal fell under a shower of balls, after a fruitless attempt to defend himself and justify his conduct. His body was exposed to the most shameful insults, and then dragged from the hotel to the bridge over the Rhone, from which it was thrown into the river.

BRUNEHILDE, married to Siegfert I., king of Austrasia, in 568, a Visigothic princess, of powerful mind, enterprising spirit, heroic resolution, deep political knowledge, and unrestrained ambition. She involved her husband in a war with his brother Chilperic, in the course of which he was murdered, A.D. 575; but she continued to live and reign till 613, when she fell into the hands of Clothair II., king of Soissons, who put her to a most terrible death, as having been the murderer of ten kings and royal princes. See **FREDIGONDE**.

BRUNEL, ISAMBARD KINGDOM, son of the eminent engineer Sir Mark Isambard Brunel, and him-

self distinguished in the same profession, was born in 1806 at Portsmouth, where his father was then residing. He was educated in France at the Henri IV. College at Caen. Like his father the bent of his genius was to mechanical pursuits, and at the age of twenty he commenced practical engineering under him at the Thames Tunnel, for which he acted as resident engineer. During the progress of the works he was more than once in imminent danger of his life by the breaking in of the river, and only saved himself by swimming. His attention was mainly directed to steam navigation and railway engineering, and of his works in these departments may be mentioned, among others, the *Great Western*, *Great Britain*, and *Great Eastern* steamships; the entire works on the Great Western Railway, to which he was appointed engineer in 1838; and the railway viaduct over the Tamar at Saltash. He was also the engineer of the Hungerford Suspension Bridge. The genius of the younger Brunel was undoubted, but in carrying through his operations he was, like his father, too apt to regard merely the attainment of a grand and brilliant result, without taking into consideration the losses and expense which might thereby be occasioned to those who had invested their capital in the undertaking. This was more especially the case with the Great Western Railway. It was remarked, in contrasting him with George Stephenson, that the works of the former never paid, while those of the latter always did. While on board the *Great Eastern*—his last work—the day before she quitted the Thames on her first disastrous cruise, Mr. Brunel was suddenly seized with paralysis, and had to be carried home. In a week afterwards he expired, on the 15th September, 1859. He became a fellow of the Royal Society in 1850, D.C.J., Oxford, 1857.

BRUNEL, SIR MARK ISAMBARD, a distinguished engineer, was the son of a Normandy farmer, and born at Hacqueville, near Rouen, on the 25th April, 1769. He was educated at the seminary of St. Nicolas, in Rouen, and from early boyhood displayed a decided turn for scientific and mechanical pursuits, amusing himself in the construction of ships, musical instruments, and machines of different sorts. At the age of fifteen he went to reside for some time with a friend of his father, a M. Carpentier, of Rouen, where he went through a course of lessons in drawing, perspective, and hydrography. In 1786 he entered the French naval service, and made several voyages to the West Indies, in which he distinguished himself both by his inventive mechanical genius and the attention and ability with which he discharged the duties of a seaman. In 1793 he returned to France; and having paid a visit to Paris, and taken part in the proceedings at one of the political clubs, he narrowly escaped proscription by venturing to oppose the ferocious doctrines then current, and was obliged to make his escape to America. Shortly after his arrival there he joined a party of Frenchmen in an expedition to explore the regions around Lake Ontario, and in 1794 he was appointed one of the surveyors of the canal now connecting Lake Champlain and the river Hudson. He was afterwards employed both as an engineer and an architect on various undertakings in the city of New York, including the erection of forts for its defence, and the establishment of an arsenal and foundry. In 1799 he proceeded to England and settled at Plymouth, where he married Miss Sophia Kingdom, whom he had formerly known at Rouen. His first work in this country was the construction of a copying machine; and he soon established his reputation as a mechanician by the invention of a machine for making the block-pulleys for the rigging of ships, which effected an

immense saving in labour and expense, and is still in full operation in the English naval dockyards. Of Brunel's subsequent achievements may be mentioned more especially the erection of the steam saw-mill in Chatham dockyard, a machine for making seamless shoes for the army, machines for making nails and wooden boxes, for ruling paper and twisting cotton into hanks, and lastly a machine for producing locomotives by means of carbonic acid gas, which, however, though partially successful, was ultimately abandoned. But the great work by which his name will be transmitted to posterity was the Thames Tunnel, which, though almost a complete failure as a commercial speculation, was nevertheless a wondrous monument of engineering skill and enterprise. It was commenced in March, 1825, and opened to the public in 1843, after a multitude of disasters and obstacles had been endured and surmounted. He was elected a fellow of the Royal Society in 1814, and vice-president from 1832-33. In 1841 the honour of knighthood was conferred on him. He died in Der 1849, universally respected, as well for his scientific genius as for his amiable temper and benevolence of disposition.

BRUNELLESCHI, FILIPPO, architect, born 1377 at Florence, devoted himself to the study of the works of Dante, to natural philosophy and perspective, the rules of which were then scarcely known. He invented various ingenious machines and mechanical contrivances. He devoted himself particularly, however, to architecture; and learned the art of drawing to make his architectural plans; statuary, to adorn them; and mechanics, that he might be able to raise the materials. He was also profoundly versed in mathematics and geometry. He is said to have drawn views of the finest monuments in Florence in perspective—an art which then excited much astonishment. This varied knowledge prepared him for bold and difficult undertakings, and he gained the name of the restorer of architecture. As a statuary he was much indebted to his intimate connection with Donatello, who was then very young but very able. Both went to Rome. Here Brunelleschi conceived the idea of restoring architecture to the principles of the Greeks and Romans. When the architects assembled in 1407 at Florence to consult upon the building of the dome of the cathedral of Santa Maria, the plan which Brunelleschi proposed received but little attention, and he went back to Rome. It was found necessary, however, to have recourse to him, as the undertaking far surpassed the powers of the other architects. He engaged to erect a dome which, by its own weight and by the strong connection of its parts, should hang suspended. This proposal seemed so wonderful that the author was regarded as insane. As all other plans, however, failed to answer the expectations of the magistrates, Brunelleschi was again recalled, and ordered to explain the mode in which he intended to execute his plan. This he refused to do, but built two small chapels according to his new system. On this the charge of erecting the dome was committed to him. As he observed that the higher the building was raised the more time was lost in going up and down, he erected some small lodgings on the dome itself, and by that means saved the labourers the time thus spent. Aided only by his own genius he accomplished the work, which remains one of the boldest creations of the human mind. But the ingenious lantern, which formed the upper part of the dome, was not finished when he died in 1444, aged sixty-seven. It was completed, however, according to his first design. Few monuments of architecture are so noble as this wonderful building. Only the dome of St. Peter's at Rome, which was built since, excels it in height.

but is inferior to it in lightness and grandeur of style. Michael Angelo said it was difficult to imitate Brunelleschi, and impossible to excel him. Brunelleschi was the author of a great number of other masterpieces of architecture.

BRUNET, JACQUES CHARLES, French bibliographer, born in 1780. He began his bibliographical career by the preparation of several auction catalogues, of which the most interesting is that of the Count d'Ourohes (Paris, 1811), and of a supplementary volume to Caillieu's and Ducloux's *Dictionnaire Bibliographique* (Paris, 1802). In 1810 was published the first edition of his *Manual du Libraire et du l'Amateur de Livres*, in three vols., which gained such universal applause that, in 1814, a second, and in 1820 a third edition, of four volumes each, were demanded. This work showed him the worthy successor of the meritorious Debure. He died at Paris 14th November, 1867. A sixth edition of his great work appeared between 1860 and 1865 in six volumes, the last containing a *Table Méthodique*, or classified catalogue, in which the works are arranged in classes according to their subjects.

BRUNL. See **BRUNO** (LEONARDO).

BRUNINGS, CHRISTIAN, one of the greatest hydraulic engineers of Holland, was born in 1786 at Neukerk, in the Palatinat. In 1769 the States of Holland appointed him general inspector of rivers. This introduced him to a share in several important commissions; for instance, that for the improvement of the dike system in 1796; that for draining the tracts between Nieuwskoge and Zevenhoven in 1797, &c. His most important works were his improvements in the diking of the lake of Haarlem, the improved diking and deepening of the Oberwasser, which at high tides often inundated vast extents of country, together with the change in the course of the Waal and the canal of Pannebe, by which the beds of the Rhine, the Waal, and the Lek were improved. He died in 1805.

BRÜNN, an Austrian city, the capital of Moravia, and of a circle of the same name, on the railway from Vienna to Prague, 70 miles n. by E. of Vienna, nearly encircled by the rivers Schwarza and Zwittawa. The pop. of the city, 31st December, 1900, was 108,944. It consists of an older portion in the centre, surrounded by fine promenades and pleasure-grounds that have taken the place of the old walls and ramparts, and of extensive newer quarters and suburbs surrounding this. It contains a cathedral and other handsome churches; a landhaus, where the provincial diet meets; several splendid palaces, a gymnasium, polytechnic institute, museum, botanic garden, &c., and has extensive manufactures of woollens, which have procured for it the name of the Austrian Leeds. Some seventy works are connected with the woollen industry, employing altogether about 12,000 hands. Other industries embrace cotton, linen, and jute; machinery, hardware, chemicals, soap and candles; beer and spirits. It is the centre of the Moravian commerce, a great part of which is carried on by fairs held at Brünn every three months. Near it is the fortress of Spielberg, on a hill about 940 feet high, in which Baron Trenck and Silvio Pellico were confined, and which now serves only as a prison. It is surrounded with finely laid-out grounds. Brünn was formerly a free imperial city, an important fortress, and the residence of the margraves of Moravia. It was unsuccessfully besieged by the Taborites in 1423; by Torstenson in 1645; by the Prussians in 1742. It was occupied by the French in 1805, and Napoleon made it his headquarters after the battle of Austerlitz. It was taken again by a division of the French army in 1809, when it suffered severely. In 1866 it was occupied by the Prussians.

BRUNO THE GREAT, Archbishop of Cologne and Duke of Lorraine, third son of Henry the Fowler, and brother of the Emperor Otto I., was born in 925, had a great share in the events of his time, and surpassed all the contemporary bishops in talents and knowledge. He was made Duke of Lorraine in 944, and had much trouble in bringing into due subjection his unruly subjects. A numerous train of learned men from all countries, even from Greece, continually followed him, and his excellent example was imitated by many prelates. He died at Rheims, October 11, 965. Commentaries on the five books of Moses, and the biographies of some saints, are ascribed to him.

BRUNO, ST.—1. The apostle of Prussia, was born about 970, and died in 1008. He entered the order of St. Benedict, and accompanied St. Adalbert on his mission to Prussia. He was appointed chaplain to the Emperor, Henry II., and was a zealous missionary in Poland, Russia, and Hungary. Having been taken by the Pagans of Lithuania, he had his hands and feet cut off, and was afterwards beheaded.—2. The most famous St. Bruno is the one who established the order of Carthusian monks. He was born at Cologne about 1030 of an old and noble family, which still flourished in the middle of the eighteenth century; was educated in the school of the collegiate church of St. Cunibert, in which also he afterwards received a canonship, and then studied at Rheims, where he distinguished himself to such a degree that Gervais, the bishop appointed him to superintend all the schools of the district. He attracted many distinguished scholars, and among others Odo, afterwards Pope Urban II. Subsequently he was offered the bishopric of Rheims, but the immorality of his times induced him to go into solitude. He repaired with six friends of a like disposition to Hugo, bishop of Grenoble, who himself, in 1084 or 1086, led them to a desert 4 or 5 leagues distant from the city, called *Chartreuse*, whence the order of monks received its name. Here, in a narrow valley overshadowed by steep rocks and bleak in the extreme, Bruno and his companions built an oratory, and small separate cells to dwell in, and founded one of the severest orders of monks. In the meantime Urban II. became pope, and in 1089 invited his former instructor to his court. Bruno reluctantly obeyed, but refused every spiritual dignity, and in 1094 received permission to found a second Carthusian establishment in the solitude of Della Torre, in Calabria. Here he lived in his former wont, ruled his new colony with wisdom, and died in the arms of his scholars, A.D. 1101. Leo X., by whom he was beatified, in 1514 permitted the Carthusians to celebrate a mass in honour of him; and Gregory XV., who ordered the process of his canonization, in 1623 extended it to the whole Catholic Church.

BRUNO, GIORGIO, a philosopher of the sixteenth century, distinguished by the originality and poetical boldness of his speculations. He was born at Nola, in the Neapolitan territory, about 1550; entered the order of Dominicans; and took refuge, probably from the persecutions which he drew upon himself by his religious doubts and his satires on the monks, at Geneva in 1580. Here, however, he was soon persecuted by the Calvinists for his paradoxes and his violence. In 1583 he stood forth at Paris as the antagonist of the Aristotelian philosophy, and as teacher of the *ars Lulliana*. His disputes with the Aristotelians caused him to leave Paris, and he then went to London, where he published several of his works, and to Oxford, where he taught for a short time. In 1586 he went by way of Paris and Marburg to Wittenberg, and from 1586 to 1588 taught his philosophy there. Why he left Wittenberg is not known, but it is certain that he went in 1588

to Helmstadt, and he seems to have visited Prague before that year. Protected by Duke Julius of Wolfenbüttel, he remained in Helmstadt till his protector died in 1589. He was then engaged at Frankfurt-on-the-Maine with the publication of some works, particularly *De Monade, Numero, et Figura*, but left this city also in 1592, and returned (it is not known for what purpose) to Italy. He remained for some time at Padua in tranquillity, until the inquisition of Venice arrested him in 1598, and transferred him to Rome. After an imprisonment of two years, that he might have opportunity to retract his doctrines, he was burned, February 16th, 1600, for apostasy, heresy, and violation of his monastic vows. This death, which he might have averted eight days before by a recantation, he suffered with fortitude. Whilst his violent attacks on the prevailing doctrines of the Aristotelian philosophy, and on the narrow-minded Aristotelians themselves, everywhere created him enemies, his rashness and pride threw him into the hands of his executioners. His philosophical writings, which have become very rare, display a classical cultivation of mind, a deep insight into the spirit of ancient philosophy, wit and satire, as well as a profound knowledge of mathematics and natural philosophy. Most of them were published between 1584 and 1591, as appears from the enumeration of the oldest editions in the Bibliographical Lexicon of Ebert (Lpg. 1821, quarto, vol. i. p. 238, et seq.). In 1585 appeared at Paris his famous *Spaccio della Bestia Trionfante* (a moral allegory, with many satirical strokes on his own times; also his work *Della Causa, Principio ed Uno* (Venice and London, 1584); besides *Del Infinito, Universo, e Mondi*. The former contains the foundation, the latter the application of metaphysics to the natural world. The doctrine is a pure Pantheism, connected with very peculiar notions of God—*Deus est monadum monas, nempe entium entitas*—a more complete Pantheistical system than had been previously exhibited, and which, since his time, Spinoza only, who, like Descartes, borrowed his ideas, has reduced to a more systematic form. The notion that God is the soul of the universe, and the world endowed with organization and life, might have been forgiven by his contemporaries; but his inference, that the world is infinite and immeasurable, and his doctrine of the plurality of worlds, at the moment when the new system of Copernicus was attacked from all quarters, could not but be looked upon as a crime. His writings are mostly in the form of dialogues, without any methodical order. His language is a strange mixture of Italian and Latin. His style is violent and fiery. The originality and loftiness of his ideas take a powerful hold on those who can understand him. His logical writings, in which he boldly and skillfully applies Raymond Lully's art of topical memory, are more obscure and less interesting. His belief in magic and astrology, notwithstanding his enlightened views of the nature of things, is to be attributed to the spirit of his age. He also wrote poems, among others, *Degli Eroi di Furori*, and a satirical comedy, *Il Candelajo*. A collection of his Italian works by Wagner appeared at Leipzig in 1830 (two vols. 8vo); a reprint of a Latin work, *De Umbris Idearum* (original, Paris, 1582), Berlin in 1808; and a biography by Domenico Berti, at Florence in 1868, which is of special interest and importance on account of the new papers it brings to light regarding the official examination of Bruno before the Inquisition of Venice. Among recent writers, Schelling resembles him the most in his metaphysics and his philosophical views of nature, and has given his name to one of his philosophical writings, *Bruno, oder über das göttliche und natürliche Princip der Dinge* (Berlin,

1802). See Bartholmæ, *Jordano Bruno de Nola* (two vols., Paris, 1846), and Miss I. Frith's *Life of Giordano Bruno* (1887).

BRUNO, or BRUNI (BRUNUS), LEONARDO, of Arezzo, whence his name *Areteino* (Aretinus), was one of the most famous of the literati at the period of the revival of classic literature in Italy. He was born in 1370, and studied law at Florence and Ravenna, but the arrival of Emanuel Chryoloras at Florence gave him a decided turn of classical learning. He afterwards filled many offices in the Roman Catholic Church, and accompanied Pope John XXIII. to Constance, where the latter was deposed, and Bruno escaped to Florence. Here he wrote his *Florentine History*, received in consequence the rights of citizenship, and afterwards, by the favour of the Medici, became secretary to the republic. In this important post he died, A.D. 1444. The merits of Bruno in spreading and advancing the study of Greek literature consist particularly in his literal Latin translations of the classics; for instance, the writings of Aristotle, the orations of Demosthenes, the biographies of Plutarch, &c. His writings are in the Latin language, with the exception of two biographies of Dante and Petrarca. His chief works are, *Historia Florentina* (Strasbourg, 1610, folio), with which is connected the *Commentarius Rerum suo Tempore Gestarum*, published in Italian at Venice (1478, folio); *De bello Italico adversus Gothos*; *Epistolæ*, &c.

BRUNSWICK (German, *Braunschweig*), a duchy and sovereign state in the north-west of Germany, forming a portion of the Germanic Empire. It comprises an area of 1425 English square miles. It is divided into eight districts—three larger and five smaller, detached from each other and surrounded by foreign possessions. About one-half of the land is arable. The family of Brunswick is one of the most ancient in Europe. (See BRUNSWICK—FAMILY OF.) In 1806 the duchy was annexed by Napoleon to the Kingdom of Westphalia, but its native prince, Frederick William, was restored in 1813. In the German Confederation Brunswick held the thirteenth rank, with two votes in the assembly, and one along with Nassau in the diet. It was afterwards a member of the North German Union, formed consequent to the dissolution of the old confederation by the victories of Prussia in the short campaign of 1866. As a state of the German Empire it now sends two members to the Bundesrath, and three deputies to the Reichstag. In its internal government Brunswick is a constitutional monarchy. The representative assembly consists of 21 deputies of the principal tax-payers, 10 of towns, 12 of communes, and 3 of the clergy. The estimated revenue and expenditure for 1898-99 were respectively £737,250 and £722,100; the debt £3,114,320. The prevailing religion is the Lutheran. The most important cultivated crops are grain, flax, hops, tobacco, potatoes, the sugar-beet, and fruits. The cultivation of fruits receives much attention. Of the cultivated area of Brunswick 75 per cent belongs to private persons, 14 per cent to corporations, and 11 per cent to the state. A good deal of attention has been given in recent times to the improvement of the breeds of cattle, sheep, and horses. The forests cover a considerable area, and over 72 per cent of this is in the hands of the state. The minerals are of some importance, including iron, lead, copper, some gold and silver, salt, asphalt, peat; besides marble, granite, sandstone, and other kinds of stone. The industrial occupations are varied if not individually important, and embrace beet-root sugar, tobacco and cigars, paper, glass, flax, jute and woollen goods, hats, wooden wares, chemicals, porcelain, sewing and other machines, lacquered wares, sal-ammoniac, chloric, in

nise, madder, and chicory, afford the principal employment of the people. The lackered wares and porcelain of Brunswick are famous even in foreign countries. Brunswick, the capital, is the centre of trade. Population of duchy (1895), 434,213.

BRUNSWICK (German, *Braunschweig*), capital of the duchy of the same name, is situated on the Ocker, and on the railway from Hanover to Berlin. It was formerly one of the free cities of Germany, but it is now subject to the duke, and has been the ducal residence since 1754. The principal buildings are the new ducal palace, the mint, the house in which the diet assembles, the town-house, the arsenal, the cathedral, museum and picture-gallery, and the public wine-cellar. The ramparts of the old fortifications have been levelled and formed into a promenade. The older streets are narrow and tortuous, and antiquated in appearance. The Collegium Carolinum was founded in 1745, and intended as a medium between the common schools and the universities. It has enjoyed a high reputation even in foreign countries, particularly in England and Russia. The principal manufactures are wool, yarn, linen, porcelain, pasteboard, paper-hangings, and chemical preparations. There is a large commerce in grain, woollens, and manufactured articles. The traffic in home produce, and the carrying trade, have been much increased by the system of railways. The Brunswick fairs, though now declining, were formerly of great importance. Population in 1895, 115,938.

BRUNSWICK, a post town of Maine, in the United States of America, in Cumberland county, on the right bank of the Androscoggin, 26 miles N.E. of Portland; lat. 43° 53' N.; lon. 69° 55' W.; pop. of township in 1891, 6012. The falls of the Androscoggin, at this place, afford excellent seats for several mills and manufactories. Bowdoin College, in this town, was incorporated in 1794, and went into operation in 1802. Connected with it is the medical school of Maine, established in 1820. It is pleasantly situated on an elevated plain, about half a mile from the Androscoggin. It has a president and fourteen professors. The students number about 200, besides fifty medical students. The library numbers about 30,000 volumes. Hawthorne and Longfellow graduated here in 1825, and the latter filled the chair of modern languages for several years. Bowdoin College was founded by James Bowdoin, son of the governor of Massachusetts, and is the oldest and most prominent literary institution in Maine.

BRUNSWICK, FAMILY OF. The true founder of this ancient house was Albert Azo II., marquis of Reggio and Modena, a descendant by the female line of Charlemagne, who had also extensive domains in Lombardy, and in 1047 married Cunigunda, heiress of the Counts of Altorf, and thus united the two houses of Este and Guelph. The previous history of the Este family is uncertain. Guelph, the son of Azo, was created Duke of Bavaria in 1071. He married Judith of Flanders, who was descended from Alfred the Great of England. The most powerful of this line was Henry the Proud, who succeeded in 1125, and by his marriage with the daughter of Lotharius II. acquired Brunswick and Saxony. Brunswick ultimately fell to a younger branch of the family, and Otho, the great-grandson of Henry by this branch, was the first who bore the title of Duke of Brunswick (1235). John, eldest son of Otho, founded the house of Lüneburg. Albert the Great, a younger son of Otho, conquered Wolfenbüttel, and on his death (1278) his three sons divided his dominions. Henry founded the house of Grubenhagen, Albert became Duke of Brunswick, and William Duke of Brunswick-Wolfenbüttel. Henry Julius of this last branch, inherited Grubenhagen (1596).

Ernest of Zell, of the second branch, who succeeded (1532), conquered the territories of Wolfenbüttel, and left two sons, by whom the family was divided into the two branches of Brunswick-Wolfenbüttel (II.) or Brunswick-Lüneburg, and Brunswick-Hanover from the latter of which comes the present royal family of Britain. The former was the Gorman family in possession of the duchy of Brunswick up till 1884, when this line became extinct on the death of the last duke Wilhelm I., who ascended the throne of the duchy in 1831. Ernest Augustus, of the Brunswick-Hanover House, was created Elector of Hanover in 1692. He married Sophia, daughter of Elizabeth, the daughter of James I. of England. Their son George succeeded his father as Elector of Hanover in 1698, and was called to the throne of Great Britain as George I. in 1714 under the Act of Settlement, 1701, which invested the succession in the heirs of the Princess Sophia, being Protestants. The British sovereigns continued to rule Hanover till the accession of Victoria, when the Duke of Cumberland succeeded. The present Duke of Cumberland, titular Duke of Brunswick and King of Hanover, would have become ruler of Brunswick but for the events which transferred Hanover to Prussia; and Prince Albert of Prussia was elected regent of Brunswick instead.

BRUNSWICK, FERDINAND, DUKE OF, fourth son of Duke Ferdinand Albert, was born at Brunswick, Jan. 11, 1721, and educated for the military profession. In 1739 he entered the Prussian service, was engaged in the Silesian wars, and became one of the most eminent generals in the Seven Years' war. He commanded the allied army in Westphalia, where, always opposed to superior forces, he displayed superior talents. He drove the French from Lower Saxony, Hesse, and Westphalia, and was victorious in the two great battles of Crefeld and Minden. (See SEVEN YEARS' WAR.) After the peace he resigned his commission on account of a misunderstanding between him and the king. From that time he lived at Brunswick, the patron of art and literature. He died in 1792.

BRUNSWICK, FRIEDRICH WILHELM, DUKE OF, fourth and youngest son of Duke Karl Wilhelm Ferdinand of Brunswick. He was born in 1771, and received the same education with his second and third brothers, who were a few years older, till the military career to which he was destined gave his studies a particular direction. In 1788 he was appointed by the King of Prussia successor of his uncle, Frederick Augustus, duke of Oels and Bernstadt. He then went to Lausanne, remained two years in Switzerland, and upon his return was made captain in a Prussian regiment of foot. During the war against France in 1792 and the following year, he fought in the Prussian armies, and was twice wounded. In 1806 he took part in the war against France, with all the fire which the oppression of Germany and his father's unhappy fate had kindled in him. He finally joined the corps of Blücher, and was made prisoner with him at Lubeck. On the death of his eldest brother he would have succeeded to the dukedom, as his other brothers were incapacitated by disease, but Napoleon prohibited his succession. He raised a free corps in Bohemia to operate against the French, but though he gained a victory over 4000 Westphalians, he was unable to make an effectual stand on the Continent. He embarked his troops for England, landed in 1809, and was received with enthusiasm. His corps immediately entered the British service, and was afterwards employed in Portugal and Spain. The Parliament granted him a pension of £8000, until he returned to his hereditary dominions, Dec. 22, 1813. The events of 1815 called him again to

arms, and he fell at Quatre Bras, June 16, 1815. Caroline, queen of England, the unfortunate wife of George IV., was a sister of this gallant prince.

BRUNSWICK, New. See **NEW BRUNSWICK.**

BRUNSWICK-LÜNEBURG, KARL WILHELM FERDINAND, DUKE OF, was born in 1735. He was the eldest son of the reigning duke Charles of Brunswick and of a sister of Frederick the Great. At the age of seven his education was committed to the Abbé Jerusalem, then chaplain to the court at Wolfenbüttel. At the age of twelve he entered, under the superintendence of Jerusalem, the Collegium Carolinum, then recently established. His tutor was the chamberlain Von Wittorf—a man of talents, but without principle. His ambition was early kindled by the achievements of Frederick II. The Seven Years' war afforded him the first opportunity of cultivating his military talents. He commanded the Brunswick troops in the allied army, and in the fatal battle at Hastenbeck, July 28, 1757, in which he recaptured a battery that had been taken by the French in the centre of the allied army, 'he showed' (such was the expression of Frederick) 'that nature had destined him for a hero.' June 23, 1768, he decided the victory of Orefeld. He took the most active part in all the enterprises of his uncle Ferdinand; and Frederick's esteem for him continued to increase, as appears from his *Geschichte des Siebenjährigen Kriegs* (History of the Seven Years' War), and his *Ode auf den Erprinzen von Braunschweig* (Ode on the Hereditary Prince of Brunswick). In 1764 he married the Princess Augusta of England. Having early become acquainted with the real situation of his native country, and drawn salutary instruction from the constant embarrassments of his father before he entered upon the government, he practised the greatest economy, living mostly retired from public business, and devoted to the arts and sciences. In 1778 he entered the Prussian service and became general of infantry, but had no opportunity of cultivating his military talents. After the death of his father (in 1780) he entered upon the government with zeal and activity. Anxious above all for the improvement of the finances, he diminished his household, discharged the debts of the state, encouraged agriculture, extended the liberty of commerce, undertook or assisted in the erection of considerable buildings, and by causing Italian operas, masquerades, &c., to be exhibited gratis, provided also for the amusement of the public. Yet, with the best intentions, he was often unsuccessful. This was the case with his plans for the improvement of public education. He invited men of learning into the country at great expense, but the projected reformation having met with innumerable obstacles, they became a burden to the state. In 1787 he was obliged to place himself at the head of a Prussian army for the support of the stadtholder of Holland. The facility with which this campaign was terminated procured the duke more reputation than he perhaps deserved. High expectations were entertained of him when the wars of the French revolution broke out. The duke received the chief command of the Austrian and Prussian army, and issued at Coblenz, July 15, 1792, the famous manifesto, drawn up in a very harsh and haughty style by a Frenchman, De Limon. It certainly did more injury to the allied forces than a hostile army could have done. It inflamed the French nation almost to fury against the insolent conquerors, who intended 'to make every city that dared to resist level with the ground and to cut their way to Paris.' The Emperor Francis approved it, and so did the King of Prussia; but the duke considered the expressions too strong. The severest passages were expunged; but its tone was

still very insolent. The duke designed to press forward from Lorraine to Paris to cut off its supplies, and thus to force it to surrender by famine. Aug. 23, 1792, *Lothgry* was taken, and, Sept. 2, Verdun. But in Champagne, a country of itself unproductive, the transport of provisions for the army from the frontiers was rendered difficult by mountains and forests. Dumouriez was encamped in the vicinity of St. Meneshold, and skirmishes took place daily; but the skilful dispositions of Dumouriez culminated in the defeat of the Germans by Kellermann at Valmy, on 20th Sept. 1792, and Brunswick-Lüneburg was obliged to conclude an armistice and to evacuate Champagne. Castles took Worms and Spire during this retreat, and, Oct. 21, captured the fortress of Mentz, and soon afterwards Frankfurt, which latter city, however, was retaken by the Prussians and Hessians, Dec. 2. The endeavours of the Germans, therefore, were principally directed to the recapture of those places. To this end the duke, in conjunction with the Austrians, opened the campaign on the Upper Rhine in 1793, took the fortress of Königstein March 7, conquered Mentz July 22, and prepared to attack the strong fortress of Landau, then in the power of the French. The French, on the other hand, Sept. 14, made a general attack on the duke and Wurmsier, from Strasburg to Saarbrück. On that day the duke had a sanguinary engagement with Moreau, in the vicinity of Pirmasens, a town belonging to the landgraviate of Hesse-Darmstadt. The French were driven from their camp near the village of Hornbach, as far as to the Saar. A month later the duke, having formed a union with Wurmsier, succeeded, October 13, in his attack on the lines of Weissenburg and his attempt to draw nearer to Landau. In order to gain another strong point of support he ventured, on the night of Nov. 18, to make an assault upon the mountain-fortress of Bitch, which is the key of the Voeges, as the roads from Landau, Pirmasens, Weissenburg, and Strasburg unite at that place. This attempt miscarried. Between the 28th and the 30th of Nov., however, he defeated a division of the army of the Moselle at Lautern, which was pressing through the mountains, under the command of Hoche, with the intention of relieving Landau. But the daily attacks of Hoche and Pichegru, without regard to the sacrifice of men and the successful attempt of the latter to break the Austrian lines near Fraschweller, Dec. 22, forced the Austrians to retreat beyond the Rhine, and occasioned the retreat of the duke also. As some difficulties had already risen between Austria and Prussia, he laid down the chief command of the army in the beginning of the year 1794. The duke continued to labour for the welfare of his country until the fatal year 1806. Although he was now of such an age that he might have retired without reproach from public life, yet he assumed burdens beyond his powers. At the beginning of the year 1806, commissioned by the King of Prussia, he made a journey to St. Petersburg relative to the war that soon broke out with France. He was then placed at the head of the Prussian army. But his physical strength was not equal to his moral energy, as was proved by the battles of Jena and Auerstadt. He was mortally wounded at the latter battle, and closed his life at Ottensen, near Altona, Nov. 10, 1806.

BRUNTON, MARY, an ingenious novelist, was the daughter of Colonel Thomas Balfour, and was born in the island of Barra, in Orkney, in 1778. In her twentieth year she married Dr. Alexander Brunton, minister at Bolton, near Haddington, afterwards at Edinburgh. She was the authoress of *Discipline* and *Self-Control*, two novels which took well with the public. She died in 1818, leaving

Emmeline, a tale, and other pieces, which were published by Dr. Brunton, with a biographical sketch.

BRUSH-WHEELS. In light machinery, wheels sometimes turn each other by means of bristles or brushes fixed to their circumference. They may also communicate circular motion by friction only. The surface brought in contact is then formed of the end grain of wood, or is covered with an elastic substance, and the wheels are pressed together to increase the friction.

BRUSSA, BRUSA, or BYRSA, a Turkish city in Asia Minor, capital of the vilayet of Khodavendik-yar, with a pop. estimated at about 78,000 Turks, Greeks, Armenians, and Jews, engaged in commerce, in the culture of the vine and the mulberry, in the reeling of silk (much of which is sent to Lyons to be there manufactured), and in the manufacture of silk stuffs, carpets, gauze, &c. In the manufacture of silk a considerable number of persons are employed, the silks being in great demand over all the East. The bazaars are filled with merchandise, and the caravans passing from Aleppo and Smyrna to Constantinople promote the commerce of the town. Before the earthquake of 1855 it contained close upon 150 mosques, and was adorned with an immense number of fountains; but from the earthquake, and a terrible conflagration, the former splendour of the town suffered greatly. It is a picturesque and interesting place, however, gardens, groves, and streams of running water being interspersed among the buildings. It is situated in a fertile and finely-wooded plain, which is inclosed by the ridges of Olympus, and abounds in hot springs, sulphurous and chalybeate, and much frequented. A railway runs between Brussa and Mudania, its port, on the Sea of Marmora, but was not put in operation for years after it was built. The castle, which is about a mile in circumference, is supposed to represent the Prusa of the ancients. Brussa was long capital of Bithynia, and one of the most flourishing towns in the Greek Empire of Constantinople. In 1326 it was taken by Orkhan, son of Othman, founder of the Ottoman dynasty; and from that epoch it was the residence of the Turkish sovereigns until the seat of empire was transferred to Adrianople.

BRUSSELS (Flemish, *Brussel*; French, *Bruxelles*), the capital of Belgium and of the province of South Brabant, is situated on the small river Senne, about 50 miles S.E. of the German Ocean; lat. 50° 51' N.; lon. 4° 22' E. Brussels is built partly on the acclivity of a hill, partly on the plain, in a country agreeably diversified by sloping heights. Like many other continental towns whose political situation has changed, its old fortifications have been transformed into boulevards. These surround the older portion of the city, extending for nearly 5 miles; they are planted with elms and linden trees in four rows, and form a wide and agreeable promenade, commanding an extensive view of the surrounding country. The numerous gates, most of which bear the names of the principal high-roads or railways which traverse the kingdom, are nearly all modern, but the Porte de Hal, built in 1370, is a remnant of the ancient fortifications, a large military tower of remarkable construction, which in later days was long used as a prison. The city now extends far beyond the boulevards. The Senne enters it by two branches, great part of one of these being now covered over. The stream is not navigable, but Brussels possesses water communication by means of canals with Charleroi, Mechlin, Antwerp, and the ocean. In many quarters within the boulevards Brussels still presents a congeries of twisted streets. That part of the upper or new town inside the boulevards, which contains the royal palace, is the principal exception. The suburbs

outside the boulevards, especially in the upper town, are large, and have recently greatly increased. The principal are the Quartier Leopold and the Quartier Louise, which are regularly and elegantly built. The principal buildings of the new town are the king's palace, the palace of the chambers, the palace of justice (a magnificent new building of colossal proportions in the classical style), the palace of the fine arts, the public library and museum, &c. The upper town is ornamented with a fine park of 17 acres, with fountains and statues, around which most of the principal buildings are situated. The lower town is rich in ancient architecture. The hôtel de ville (built 1401-55), one of the finest municipal buildings in Belgium, is an imposing Gothic structure, with a spire 864 feet in height. The square in front of it is perhaps the most interesting of all the public places of Brussels. The cathedral of Saint Gudule is the finest of many fine churches, richly adorned with sculptures and paintings. It was founded in 1010, and its reconstruction, commenced in 1226, was carried on till the seventeenth century. The churches of Notre-Dame-de-la-Chapelle and Notre-Dame-des-Victoires are also edifices of great beauty. The monuments of Brussels, and the specimens of painting and sculpture with which its public buildings are adorned, are too numerous to mention.

During the middle ages Brussels did not attain to the extent or importance of several other cities of the Low Countries. The Emperor Otto dated a decree from Brussels in 976. It was walled by Baldric, count of Louvain, in 1044. It was more completely fortified in 1380, the wall then following nearly the line of the present boulevard. During the fifteenth century it was twice burned and once ravaged by the plague. It was the scene, in 1568, of the execution of Counts Egmont and Horn. It was bombarded and burned by the French in 1695, and was the headquarters of Marlborough after the battle of Ramillies. It was taken by the French in 1794, and retained till 1814, when it became the chief town of the department of the Dyle. From 1815 to 1830 it was one of the capitals of the Kingdom of the Netherlands, and in 1830 it was the chief centre of the revolt which separated Belgium from Holland. Since then it has been the capital of the Belgian kingdom, and one of the centres of European civilization, being especially distinguished, far beyond its relative importance, for the cultivation and patronage of art.

The scientific, literary, artistic and benevolent institutions of Brussels comprise a free university, founded in 1834, a proprietary institution, with about sixty professors and assistants, comprising four faculties, mathematical and physical sciences, belles-lettres, law, and medicine, a school of geography, founded in 1830, with an extensive museum, embracing geology, chemistry, and natural history, one of the finest observatories in Europe; the Belgian Royal Academy of Sciences, Letters, and Fine Arts, and the Royal Academy of Fine Arts; the public library, containing 350,000 volumes and 30,000 valuable manuscripts; the picture gallery, with the finest specimens of Flemish art; the Royal School of Medicine, many institutions for elementary education, societies of horticulture and other natural sciences, several hospitals, an infirmary, a philanthropic society, &c.

The manufactures and trade of Brussels are greatly promoted both by its canal communications and by the net-work of Belgian railways. Printing, type-founding, and all the other departments of book-making, give employment to a large section of the population. Until 1852 the reprinting of French contemporary works was extensively carried on,

but in that year a treaty with France gave protection to works of literature and art. *Leeds* was an ancient manufacture, and is still of some importance; the printing of cotton and woollen fabrics, muslins, &c., and many minor manufactures are carried on. Brussels carpets are chiefly made at Tournai, but some are manufactured in the city. There are breweries, distilleries, sugar-refineries, foundries of iron and brass, steam-engine factories, &c. The trade carried on by the canals and railways is that of a capital city and manufacturing town, for the supply of internal wants and the distribution of its own products. The languages spoken in Brussels are French, and Flemish or Dutch, the former chiefly spoken in the new town, the latter chiefly in the old. English is also a good deal spoken, from the number of English residents and visitors. The population of Brussels on 31st December, 1897, was 551,011, including the suburbs.

BRUSSELS SPROUTS, one of the cultivated varieties of cabbage (*Brassica oleracea sabauda*). They have an elongated stem 4 or 5 feet high, and small green heads like miniature cabbages. They are cultivated for the table and are considered a delicacy.

BRUTUS, or **BRUTE**, in the fabulous history of Britain, was the first king of the island, according to Geoffrey of Monmouth. He is said to have been the son of Sylvius, and grandson of Ascanius, the son of Æneas, and to have been born in Italy. He landed at Totness, in Devonshire, destroyed the giants who then inhabited Albion, and called the island from his own name. At his death, the island was divided among his three sons: Loocrine had England, Cumber Wales, and Albanact Scotland.

BRUTUS, **LOCUS JUNIUS**, son of Marcus Junius and the daughter of the elder Tarquin, saved his life from the persecutions of Tarquin the Proud by feigning himself insane, on which account he received the surname *Brutus* (stupid). During a plague that broke out at Rome he accompanied the son of Tarquin to the oracle in Delphi. When Lucretia, the wife of Collatinus, plunged a dagger into her bosom, that she might not outlive the insult which she had suffered from Sextus, the son of Tarquin, Brutus, being present, threw off the mask. He drew the dagger, all bloody, from the wound, and swore vengeance against the Tarquins, explaining to the astonished spectators the reason of his pretended imbecility, and persuading all who were present to take the same oath. The people submitted to his guidance, and he caused the gates to be shut, the inhabitants to be assembled, and the body to be publicly exposed. He then urged the banishment of the Tarquins. After this had been resolved on, Brutus proposed to abolish the regal dignity, and introduce a free government. It was then determined that two consuls should exercise supreme power for a year, and Junius Brutus and Tarquinius Collatinus were chosen for the first term. Tarquin, who had seen the gates shut against him, and found himself deserted by his army, sent ambassadors to Rome to demand a restoration of his private property, and, at the same time, to promise that he would make no attempt against the republic. His request was granted. The ambassadors, however, set on foot a conspiracy, and drew into it many young men, among whom were the two sons of Brutus and the nephews of Collatinus. But a slave named Vindex discovered the plot. The criminals were imprisoned, and the consuls caused the people the next morning to be called to a meeting. All were deeply shocked to see the sons of Brutus among the prisoners, and their father on the judgment-seat to condemn them. Collatinus wept, and even the stern

Valerius sat silent. But Brutus arose firmly, and, after their crime had been proved beyond a doubt, ordered the lictors to execute the law. Neither the entreaties of the people nor of his sons could alter his resolution. He witnessed the horrible spectacle without emotion, and did not leave the assembly until after the execution. He was called back, however, when Collatinus wished to save his guilty nephews. The people condemned them all, and chose Valerius consul in place of Collatinus. In the meantime, Tarquin, supported by Porseus, collected an army and marched against Rome. The consuls advanced to meet him. Brutus led the cavalry; Aruns, son of Tarquin, commanded the body opposed to him. They pierced each other with their spears at the same moment, and both fell, A.C. 509. The Romans came off conquerors, and Brutus was buried with great splendour. The women lamented him a whole year, as the avenger of the honour of their sex. The details of the story of Brutus, which may be regarded as a poetical legend, have been shown by Niebuhr to be irreconcilable with history. The surname Brutus is supposed by modern scholars to be nearly equivalent, in early Latin, to that of Severus, which was common at a later period. It was the surname of a plebeian family which played an important part in the history of Rome.

BRUTUS, **MARCUS JUNIUS**, one of the most distinguished Romans at the close of the republican period, was born A.C. 85, of a plebeian family. He was at first an enemy of Pompey, who had slain his father in Gallia, but forgot his private enmity, and was reconciled to him when he undertook the defence of freedom. He did not, however, assume any public station, and after the unfortunate battle of Pharsala, surrendered himself to Cæsar, who received him generously, allowed him to withdraw from the war, made him in the following year governor of Cisalpine Gaul, and afterwards conferred on him the government of Macedonia. Notwithstanding these benefits, Brutus allowed himself to be drawn into, and made the head of the conspiracy against Cæsar. He was led into the conspiracy by Cassius, who, impelled by hatred against Cæsar, sought, at first by writing, and then by means of his wife, Junia, sister of Brutus, to gain his favour; and when he thought him prepared for the proposal, disclosed to him verbally the plan of a conspiracy against Cæsar, who had now made himself master of the supreme power in the state. Brutus was induced to agree to the design, and his influence led many of the most distinguished Romans to embrace it also. Cæsar was assassinated in the senate-house. In public speeches Brutus explained the reasons of this deed, but he could not appease the dissatisfaction of the people, and retired with his party to the capitol. He soon after took courage, when the consul P. Cornelius Dolabella, and the prætor L. Cornelius Cinna, Cæsar's brother-in-law, declared themselves in his favour. But Antony, whom Brutus had generously spared, was reconciled to him only in appearance, and obtained his leave to read Cæsar's will to the people. By means of this instrument Antony succeeded in exciting the popular indignation against the murderers of Cæsar, and they were compelled to flee from Rome. Brutus went to Athens, and endeavoured to form a party there among the Roman nobility; he gained over, also, the troops in Macedonia. He then began to levy soldiers openly, which was the easier for him, as the remainder of Pompey's troops, since the defeat of their general, had been roving about in Thessaly. Hortensius, the governor of Macedonia, aided him; and thus Brutus, master of all Greece and Macedonia, in a short time stood at the head of a powerful army. He went now to Asia

and joined Cassius, whose efforts had been equally successful. In Rome, on the contrary, the triumph prevailed. All the conspirators had been condemned, and the people had taken up arms against them. Brutus and Cassius having with difficulty subdued the Lycians and Rhodians, returned to Euboea to oppose the triumvir. (Plutarch informs us that a spirit appeared to Brutus, on his march from Sardis to Abydos, in Asia Minor.) The army passed over the Hellespont, and nineteen legions and 20,000 cavalry were assembled on the plains of Philippi, in Macedonia, whither also the triumvirs, Antony and Octavianus (afterwards the emperor Augustus), marched with their legions. Although the Roman historians do not agree in their accounts of the battle of Philippi, this much at least seems certain, that Cassius was beaten by Antony, and caused himself to be killed by a slave; that Brutus fought with greater success against the division of the army commanded by Octavianus, who was hindered by indisposition from conducting the battle in person; that after the engagement he took possession of an advantageous situation, where it was difficult for an attack to be made upon him; twenty days after he was induced, by the ardour of his soldiers, to renew the contest, and was this time totally defeated. He escaped with only a few friends, passed the night in a cave, and as he saw his cause irretrievably ruined, ordered Strato, one of his confidants, to kill him. Strato refused, a long time, to perform the command; but, seeing Brutus resolved, he turned away his face, and held his sword, while Brutus fell upon it. Thus died this celebrated Roman, in B.C. 42, in the forty-third year of his age. Brutus was a man of little independent judgment, a mere student, liable to be swayed by others, and he was in no sense a martyr to a genuine patriotism. He was the author of philosophical and historical treatises, orations, &c., but only a few fragments of his writings are extant.

BRUYÈRE, JEAN DE LA, French writer, the famous author of the *Caractères*, in which he depicts the manners of his age, was born at Paris, 1646. He purchased the place of treasurer at Caen, and afterwards, through the influence of Bossuet, he was employed in the education of the Duke of Bourbon, grandson of the great Condé, with a pension of 3000 livres, and was attached to his person during the remainder of his life. In 1688 he published the *Caractères de Theophrastus*, translated into French with much elegance, and accompanied them with other similar characters, in which he represented the manners of his time with great accuracy; and in a style epigrammatical, ingenious, and witty. Bruyère often took his characters from living persons, although he denied it, and seems by this means to have gained many enemies. He was a man of pleasant manners and amiable disposition. In 1693 he was elected a member of the French Academy, with some opposition. He died at Versailles, 10th May, 1696.

BRYANT, JACOB, a philologist and antiquary, was born at Plymouth in 1715, and died in 1804 at his country seat, near Windsor. He studied at Eton and King's College, Cambridge, became afterwards tutor of the sons of the famous Duke of Marlborough, the eldest of whom he also accompanied to the Continent as his secretary. After his return he received, by the influence of his patron, a lucrative post in the ordinance, which gave him leisure for his researches into Biblical, Roman, and Grecian antiquities. His most important work is the *New System of Ancient Mythology*, which appeared in three vols. 4to, 1774-76. Whatever may be the ingenuity and the learning of the author, it is justly objected that he has taken conjectures for proofs, and, in particular, that he has trusted too much to the deceptive conclusions of ety-

mology. He was engaged in a famous dispute on the veracity of Homer and the existence of Troy, in which he endeavoured to show that there never was such a city as Troy, and that the whole expedition of the Greeks was a mere fiction of Homer. The object of one of his earlier treatises, which appeared in 1767, is to show that the island Melita, on which St. Paul was wrecked, was not Malta, but situated in the Adriatic. He endeavoured to illustrate the Scriptures by explanations drawn from Josephus, from Philo the Jew, and from Justin Martyr; but in this, as in all his writings, his learning and his ingenuity are misled by his love of controversy and paradox.

BRYDGES, SIR SAMUEL EGERTON, antiquary, was born in Wootton House, Kent, on Nov. 30th, 1762. Educated at Maidstone and Canterbury, he passed to Queen's College, Cambridge, and was called to the bar at the Middle Temple in 1787. Five years later he retired to a country seat in his native county to devote himself to his favourite literary and antiquarian pursuits. In 1785 he published a volume of verse, which was followed at intervals by others and by two or three novels. In 1800 he produced an augmented edition of Edward Phillips's *Theatrum Poetarum Anglicanorum*, and in 1806 he began to prepare a new edition of Collins's *Peerage of England*. The ten volumes of his *Censura Litteraria*, containing Titles, Abstracts, and Opinions of Old English Books, &c., appeared between 1805 and 1809. From 1789 till 1803 he was occupied without success in pressing the claim of his elder brother to the barony of Chandos. In 1808 he became a knight of the Swedish order of St. Joachim, and in 1814 a baronet of the United Kingdom. He sat in the House of Commons for Maidstone from 1812 till 1818, and about this period he issued from a private press at Lee Priory, near Canterbury, a number of editions of rare English works, mostly of the Elizabethan period. From 1818 till his death at Campagne, near Geneva, on Sept. 8th, 1837, he lived almost continuously on the Continent. Other works by him are *The British Bibliographer* (4 vols., 1810-14), with Mr. J. Haslewood; *Restituta*, or Titles, Extracts, and Characters of Old Books in English Literature revived (4 vols., 1814-16); *Excerpta Tudoriana*, or Extracts from Elizabethan Literature, with a Critical Preface (2 vols., 1814-18); *The Sylvan Wanderer* (2 vols., 1813-17), a series of essays; *Res Litterariæ* (3 vols., 1821-22); *Polyanthes Librorum Vetusiorum* (1822); *Cimelia* (1823); *Recollections of Foreign Travel* (2 vols., 1825); *Lake of Geneva* (1831), a poem in blank verse; *Lex Terræ* (1831), a legal work, &c. In 1834 appeared in two volumes *The Autobiography, Times, Opinions, and Contemporaries of Sir Egerton Brydges*.

BRYDONE, PATRICK, F.R.S., Scottish traveller, was son of the minister of Coldingham, Berwickshire, and was born there in 1741; he died in 1818. He received a university education, and for some time acted as a travelling tutor, in which capacity he made a tour through Sicily and Malta in 1770. His account of this was published in 1773, and became immensely popular, both from the interest of the narrative and the vivacity and elegance of its style. Brydone was subsequently appointed a comptroller of stamps, and married a daughter of Dr. Robertson the historian. The latter part of his life was spent in dignified retirement at Lennel House, near Coldstream.

BRYOZOA (Gr. *bryon*, moss, and *zoon*, an animal), an order of compound polypes, which incrust foreign bodies like moss. The more common name is *Polyzoa*. See *POLYZOA*.

BUBNA LITZ, FERDINAND, COUNT OF, born at Zamerak, Bohemia, 1763, of an old family, was, early in life, the chamberlain of the Emperor of

Austria, afterwards entered the military service, and after distinguishing himself on various occasions, at Manheim, in the defence of Bohemia (1800), and at Austerlitz, he gained at Wagram, in 1809, the rank of field-marshal-lieutenant. At the end of 1812 he was sent by his court with extraordinary commissions to Napoleon at Paris, and in May, 1813, was sent again to him at Dresden. In the war of 1813 he commanded an Austrian division with much honour, was present at the battles of Lützen, Bautzen, Dresden, and Leipzig, and in 1814 received the chief command of the Austrian army which was to pass through Geneva to the s. of France. He advanced upon Lyons, which was defended by Marshal Augereau, but was unsuccessful in his attacks upon the city, till the corps of Bianchi and Hessen-Homburg came to his assistance, upon which the Prince of Hessen-Homburg took the chief command. Bubna remained at Lyons till the return of the allied forces, and then retired to Vienna. After the landing of Napoleon in 1815, he again led a corps, under Frimont, against Lyons, and in Savoy opposed Marshal Suchet, till Paris was conquered, and the marshal retreated beyond Lyons. He then took possession of Lyons without opposition, established a court-martial to punish the disturbers of public order, and proceeded with greater severity than on his former campaign. In September he marched back to Austria, and received for his services valuable estates in Bohemia from the emperor. In the insurrection of Piedmont, 1821, the Count de Bubna received the chief command of the Austrian troops destined to restore the ancient government. After the accomplishment of this commission, he was appointed general commandant of Lombardy. He died at Milan, June 6, 1825, in the fifty-sixth year of his age.

BUCCANEERS, a name applied to various bands of English and French freebooters in America, whose exploits form one of the most remarkable parts of the history of the seventeenth century. The origin of these associations of buccaneers seems to have been the arrogant pretensions of the Spaniards to the dominion of the whole of America. The English and French settlers combining against them for mutual defence, acquired from their precarious life in the vicinity of the Spanish settlements, adventurous and lawless habits, and became ultimately, in some of the islands of the Caribbean Sea, little better than pirates. The earliest association of this kind began about 1625, but they afterwards assumed greater magnitude. After the assassination of Henry IV. in France in 1610, several Frenchmen sought a residence on the island of St. Christopher, one of the Antilles. Driven thence in 1630, some of them fled to the western coast of St. Domingo, others to the small island of Tortugas, in the vicinity. Several Englishmen, led by a similar disposition, associated themselves with the latter. The fugitives at St. Domingo employed themselves especially in the chase of wild cattle, of which there were large herds on the island. They sold the hides to the mariners who landed on the coast, and as they cured the flesh by smoking it before the fire, like the American savages, they were called *buccaneers*, from the Caribbee *boucan*, a place for smoke-drying meat. These hunters lived in the rudest state of nature, enjoying in common all that they had taken in the chase or acquired by robbery. The Spaniards, who could not conquer them, determined to extirpate all the cattle on the island, and thus obliged the buccaneers either to cultivate the land as husbandmen, or to join the other freebooters on the island of Tortugas. These bold adventurers attacked, in small numbers and with small means, but with an intrepidity which bade defiance to danger, not only single

merchant vessels, but several of them together, and sometimes armed ships. Their common mode of attack was by boarding. They directed their efforts especially against the Spanish ships which sailed for Europe laden with the treasures of America. By the repeated losses which they suffered, the Spaniards were at last so discouraged, that they seldom offered a serious resistance. It happened once that a ship of the buccaneers fell in with two Spanish galleons, each of which had sixty cannon and 1500 men on board. To escape was impossible, and the pirates could not think of surrender. Their captain, Laurent, made a short speech to them, sent one of his men to the powder-room with orders to set fire to it upon the first sign which he should give him, and then placed his men in order of battle on each side. 'We must sail between the enemy's ships,' cried he to his crew, 'and fire upon them to the right and left.' This manoeuvre was executed with extraordinary rapidity. The fire of the pirate killed so many people on board both ships, that the Spaniards were struck with a panic, and let him escape. The Spanish commander was afterwards put to death on account of the disgrace which he had brought upon his nation. Their frequent losses greatly reduced the trade of the Spaniards with America. The buccaneers now began to land on the coast, and to plunder the cities. Their manner of dividing the booty was remarkable. Every one who had a share in the expedition swore that he had reserved nothing of the plunder. A false oath was of extremely rare occurrence, and was punished by banishment to an uninhabited island. The wounded first received their share, which was greater according to the severity of their wounds. The remainder was divided into equal parts, and distributed by lot. The leader received more than the others only when he had particularly distinguished himself. Those who had perished in the expedition were not forgotten. Their part was given to their relations or friends, and in default of them, to the poor and to the church. Religion was strangely blended with their vices, and they always began their enterprises with a prayer. The wealth which they acquired was spent in gambling and debauchery, for it was the principle of these adventurers to enjoy the present and not care for the future. The climate and their mode of life gradually diminished their number, and the vigorous measures of the British and French governments at last put an end to their outrages, which had, perhaps, been purposely tolerated. From this band of pirates arose the French settlements on the western half of St. Domingo. In the beginning of the eighteenth century the pirates of the buccaneers had entirely ceased. An account of their mode of life and of many of their deeds is to be found in the tenth volume of Raynal's History of the Two Indies, and in Burney's History of the Buccaneers.

BUCENTAUR, in mythology a monster, half man and half ox or ass. The splendid galley in which the dogs of Venice annually sailed over the Adriatic on Ascension day also bore this name. Dropping a ring into the sea, he espoused it in the name of the republic, with the words '*Desponsamus te, mare, in signum veri perpetue domini*.' The custom originated in 1170, when the doge, having refused to deliver up the pope, who had taken refuge in Venice, to the emperor, encountered and defeated the imperial fleet which was sent to reduce the Venetians.

BUCEPHALUS, the horse of Alexander the Great, which he bought for thirteen talents (about £2500). Philonous, a Thessalian, offered to sell him to King Philip; but Philip, who considered the price too great, commanded the unmanageable steed

to be led away, when the young Alexander offered to mount him. He mounted accordingly, and to the astonishment of all the horse obeyed him, and willingly submitted to his guidance, though he had never before obeyed a rider. Alexander, from this circumstance, conceived such an affection for him that he never rode upon any other horse; and Bocephalus also, when comparison for battle, suffered no other rider. He died of a wound, and Alexander caused him to be buried near the Hydaspes, and built over his grave a city, which he called *Bucrophala*.

BUCER, MARTIN, born 1491 at Schelestadt, in Alsace. He died in the office of professor of theology at Cambridge, 1551. In 1521 he left the Dominican order, and became a convert to Lutheranism. He was at first preacher at the court of Frederick, the elector of the Palatinate, afterwards in Strasburg, and at the same time professor in the university there for twenty years. He took part in the conference of Marburg with the hope of reconciling Luther and Zwinglius. In 1548 King Edward VI. of England, at the suggestion of Archbishop Cramer, invited him to Cambridge. In 1557 Queen Mary caused his bones to be burned, to show her detestation of Protestantism. This sentence was repealed, and his memory restored to honour in the reign of Queen Elizabeth. The Cardinal Contarini called him the most learned divine among the heretics. He wrote a commentary on the Psalms under the name of Aretius Filius, and many other works.

BUCEROS. See **HORN-BILL**.

BUCH, LEOPOLD VON, a celebrated German geologist, born at Stolpe in Prussia in 1774, studied under the celebrated Werner in the mining school of Freiberg in Saxony, where Alexander von Humboldt was his fellow-student. He early began to distinguish himself by his geological writings. His first works were Descriptions of the Mineralogy of Landeck, and of the Geognony of Silesia. In 1798 he proceeded to Italy. Up to this period he had adopted the Neptunian theory of Werner, with some modifications; but he now saw cause to abandon it, and to recognize the volcanic origin of the basalts. He saw Vesuvius for the first time in 1799; but afterwards, in 1805, had an opportunity, along with Humboldt and Gay Lussac, of witnessing its actual eruption. In 1802 he examined the extinct volcanoes of Auvergne in the s. of France. The results of all these geological travels were given to the world in a work entitled *Observations during Travels in Germany and Italy* (two vols. Berlin, 1802-09). Indefatigable as an observer, Von Buch turned his steps from the s. of France in 1806, and proceeding to Scandinavia spent two years in examining its physical constitution. This furnished the materials for his well-known work entitled *Travels in Norway and Lapland*. In 1815 he visited the Canary Isles along with Christian Smith, a Norwegian botanist, who perished a few years after in the unfortunate expedition of Captain Tuckey to the mouth of the Zaire. These volcanic isles, amid which the Peak of Teneriffe rises so majestically, furnished the starting-point from which Von Buch commenced a regular course of study on the production and activity of volcanoes. This is attested by his standard work on the subject, entitled *Physical Description of the Canary Isles* (Berlin, 1825, with atlas). On his return from the Canaries he visited the basaltic group of the Hebrides and the coasts of Scotland and Ireland. His geological excursions, even in countries which he had repeatedly visited before, continued without interruption at a very advanced age, till within a few months of his death, which took place at Berlin in 1853. Alexander von Humboldt, who had known him intimately for a period of more than sixty years, calls

him the greatest geologist of our period. He was unmarried, and lived aloof from the world, entirely devoted to scientific pursuits. Besides the works already mentioned he was the author of many important tracts on paleontology, as, *On the Ammonites*, 1832; *On the Terebratula*, 1834; *On the Cystids*, 1845; and on the *Ceratites*, 1841. Another of his works not to be omitted is his magnificent *Geological Map of Germany*.

BUCHAN, a district of Scotland, lying partly in Aberdeenshire and partly in Banffshire, along the coast between the mouths of the Deveron and the Ythan.

BUCHAN, WILLIAM, M.D., a popular medical writer, was born in 1729 at Ancrum in Roxburghshire. Being destined by his friends for the church, he repaired to Edinburgh to study divinity. At the university he spent nine years, studying anything rather than theology. At this period of his life mathematics and botany were among his favourite pursuits. Finally he devoted himself wholly to medicine. He enjoyed at this time the friendship of the illustrious Gregory, whose liberal maxims are believed to have had great influence over his future life. Before taking his degree he was induced by the invitation of a fellow-student to settle in practice for some time in Yorkshshire. While established in that district he became physician to the Ackworth founding hospital, in which situation he laid the foundation of that knowledge of the diseases of children which afterwards appeared so conspicuous in his writings. He afterwards removed to Sheffield, where he appears to have spent the years between 1762 and 1766. He then commenced practice at Edinburgh, and for several years was very well employed, though it was allowed that he might have enjoyed much more business if his convivial habits had not distracted so much of his attention. Having for a considerable time directed his attention to a digest of popular medical knowledge, he published in 1769 his work entitled *Domestic Medicine*; or, the *Family Physician*—being an attempt to render the medical art more generally useful by showing people what is in their own power, both with respect to the prevention and cure of diseases. The second edition appeared in 1772. The *Domestic Medicine* is constructed on a plan similar to that adopted by Tissot in his *Avis au Peuple*. It appealed to the wants and wishes of so large a class of the community, that, considering it to have been the first work of the kind published in Britain, there is no wonder that it should have attained success. Before the death of the author, in 1805, nineteen large editions had been sold. Duplan of Paris, physician to the Count d'Artois (Charles X.), published a translation in five volumes, with some excellent notes, which rendered the work so popular on the Continent that in a short time no language in Christendom wanted its translation. It would almost appear that the work met with more undivided applause on the Continent than in Britain. While many English and Scottish physicians conceived that it was as apt to generate as to cure or prevent diseases, by inspiring the minds of readers with hypochondriacal notions, those of other countries entertained no such suspicions. Among the testimonies of approbation which Dr. Buchan received from abroad was a huge gold medallion, sent by the Empress Catherine of Russia, with a complimentary letter. The work is said to have become more popular in America and the West Indies than in the older hemisphere. The reputation which the author thus acquired induced him to remove to London, where for many years he enjoyed a lucrative practice. It was his custom to resort daily to the Chapter Coffee-house, near St.

Paul's, where he partly spent his time in conversation with literary and eminent men, and partly in giving advice to patients, who waited upon him here in great numbers just as if it had been his own house. At one time he delivered lectures on natural philosophy, and in this capacity he is said to have manifested as respectable abilities as in his character of a physician. He died in 1805. Besides the above he published two other works:—1. *A Treatise on Gonorrhoea*; 2. *An Advice to Mothers on the Subject of their own Health, and on the Means of Promoting the Health, Strength, and Beauty of their Offspring*; each in one volume, 8vo.

BUCHANAN, CLAUDIUS; D.D., a clergyman who distinguished himself as a missionary in India, was born at Cambuslang, a village in Scotland, in 1768, and died in 1815. He was educated at the University of Glasgow and Queen's College, Cambridge. He took orders in the Church of England, and was appointed chaplain to the East India Company in 1796. From this time the remainder of his life was occupied in missionary labours in India, and in forwarding the translation of the Bible into the Indian languages. In 1800 he was appointed professor of Greek, Latin, and English in the College of Fort-William. He returned to Europe in 1808, afterwards visited the Holy Land, and was engaged at his death in a translation of the New Testament into Syriac. He published *Christian Researches in Asia, with a Notice of the Translation of the Scriptures into the Oriental Languages* (1811), and several other works.

BUCHANAN, FRANCIS, M.D., born in Stirling-shire, 15th February, 1762; died, 1829. He travelled extensively in the East Indies, making collections illustrative of the botany, zoology, &c., of the countries which he visited, published in 1807 *A Journey from Madras through the Countries of the Mysore, Canara, and Malabar, performed under the orders of the Marquis Wellesley for the purpose of investigating the state of Agriculture, Arts, and Commerce, &c., History, Antiquities, &c., in the Dominions of the Rajah of Mysore, &c.* (Lon. 1807). He contributed largely to the scientific journals of the day, and in 1819 he published a *History of the Kingdom of Nepal*, and in the same year a *Genealogy of the Hindoo Gods*, which he had drawn up some years before with the assistance of an intelligent Brahmin. In 1822 appeared his *Account of the Flashes of the Ganges, with plates*.

BUCHANAN, GEORGE, one of the most distinguished reformers, political and religious, of the sixteenth century, and the best Latin poet which modern Europe has produced, was born in the parish of Kilmearn, Stirling-shire, in February, 1506, 'of a family,' as he says himself, 'more ancient than wealthy.' He received the rudiments of his education in the school of his native village, and having at an early period given indications of genius, his maternal uncle, James Harlot, was induced to undertake the care of his education, and sent him in 1520, when fifteen years of age, to prosecute his studies in the University of Paris. Before he had completed his second year there his uncle died, leaving him in a foreign land exposed to all the miseries of poverty, aggravated by bodily infirmity, occasioned, most probably, by the severity of his studies. He was now obliged to return home, and for upwards of a twelvemonth was incapable of applying to any business. In 1523 he joined the auxiliaries brought over from France by Albany, then regent of Scotland, and served as a private soldier in one campaign against the English. Albany soon found himself under the necessity of recrossing the Tweed, and being overtaken by a severe snow-storm in a night march toward Lauder, lost a

great part of his army; Buchanan escaped, but was confined the rest of the winter to his bed. In the ensuing spring he was sent to the University of St. Andrews to attend the lectures of John Maie, or Major, in St. Salvator's College. Having continued one session at St. Andrews, where he took the degree of Bachelor of Arts on the 3d of October, 1525, being then an exhibitor, he accompanied Major to France the following summer. There he became a student in the Scots College of Paris, and in March was incorporated a Bachelor of Arts—the degree of Master of Arts he received in April, 1528. In June the following year he was elected procurator for the German nation, one of the four classes into which the students were divided, and which included those from Scotland. At the end of two years he was elected a professor in the College of St. Barbe, where he taught grammar three years. Soon after he attracted the notice of Gilbert Kenning, earl of Cassilis, then studying in Paris; and at the end of three years he was engaged to devote his time entirely to the care of the young earl's education. With this nobleman he resided as a preceptor for five years, and to him he inscribed his first published work, a translation of Linsacre's *Rudiments of Latin Grammar*, which was printed by Robert Stephens in 1533.

In 1536 James V. made a matrimonial excursion to France, and having married Magdalene, daughter of Francis I., returned to Scotland in May, bringing with him Cassilis and George Buchanan. The connection between Buchanan and the earl seems not to have been immediately dissolved; for it was while residing at the house of his pupil that the poet composed *Somnium or the Dream*, apparently an imitation of a poem of Dunbar's, entitled *How Dunbar was desyr'd to be ane Friar*, and a bitter satire upon the impudence and hypocrisy of the Franciscans. This piece of rallery excited the utmost hostility on the part of its objects, and to avoid their vengeance Buchanan had determined to retire to Paris. James V., however, took him under his protection, and retained him as preceptor to his natural son, James Stuart. Buchanan afterwards wrote his *Palinodia* in two parts, a covert satire, which wounded the ecclesiastics still more painfully than its predecessor; and his *Franciscanus*, one of the most pungent satires to be found in any language. The Catholic clergy being still the dominant party in Scotland, Buchanan, to avoid persecution, fled to England, and afterwards to France. At Paris, to his dismay he found Cardinal Beaton resident as ambassador from the Scottish court. This circumstance rendered it extremely unsafe for him to remain; happily he was invited to Bordeaux by Andrea Govea, a Portuguese, principal of the College of Guienne, lately founded in that city, through whose interest he was appointed professor of humanity in that afterwards highly famed seminary. Here Buchanan remained for three years, during which he completed four tragedies, besides composing a number of poems on miscellaneous subjects. He was all this while the object of the unwearied enmity of Cardinal Beaton and the Franciscans, who threatened his life. Among his pupils at Bordeaux Buchanan numbered the celebrated Michel de Montaigne, who was an actor in every one of his dramas; and among his friends were not only his fellow-professors, but all the men of literature and science in the city and surrounding country. One of the most illustrious of these was the elder Scaliger, who resided and practised as a physician at Agen; at his house Buchanan and the other professors used to spend part of their vacations. The many excellent qualities of this eminent scholar, and the grateful recollection of his conversational talents, Buchanan has preserved in an elegant Latin epigram, appa-

rently written at the time when he was about to quit the seat of the muses to enter upon new scenes of difficulty and danger. After having resided three years at Bordeaux, Buchanan removed to Paris, and in 1544 we find him one of the regents in the college of Cardinal le Moine, which position he seems to have held till 1547.

In the year 1547 Buchanan passed into Portugal along with Govea, who was recalled by King John III. to take the superintendence of the newly-founded University of Coimbra. Buchanan had hoped to enjoy greater tranquillity here than in France, which was then, at the beginning of the reign of Henry II., threatened with social convulsions from religious differences. Govea, however, died in less than a twelvemonth, and Buchanan soon found himself exposed to the jealousy of the priests. The Inquisition took him under its cognizance, and sentenced him to be confined in a monastery that he might by the inmates be instructed in the principles and practice of religion. Here he consoled himself by planning and in part executing his unrivalled paraphrase in Latin verse of the Psalms of David. The probability is that the poor monks were incapable of appreciating his labours; but he seems to have gained their good-will, for he was restored to his liberty, and obtained the king's permission to return to France. Immediately on his arrival in Paris he was appointed to a regency in the College of Boncourt. In this station he remained till 1555, when he was engaged by the celebrated Comte de Brisac to act as domestic tutor to his son, Timoleon de Cossé. To this nobleman he had addressed a poetical tribute after the capture of Vercelli, an event which occurred in September, 1553; and to him also he dedicated his Latin tragedy of Jephthes (Jephthah) in the summer of 1554. The Comte next year called the poet into Italy, and charged him with the education of his son, who was then twelve years of age, and with whom he parted at the age of seventeen. During the five years of his connection with this illustrious family, Buchanan's residence was alternately in France and Italy, and as his pupil was destined to the profession of arms, and had different masters to attend him, he found leisure for prosecuting his poetical studies, and formed the design and composed part of his philosophical poem *De Sphæra*, which he addressed to his pupil. His future avocations prevented him from completing this poem. At this time there was published the first specimen of his version of the Psalms, and his translation of the *Alcestis* of Euripides. His ode on the surrender of Calais was also composed while in Brisac's family. But much of his spare time was employed in examining the grounds of his religious belief, and settling to his own satisfaction the great question between the Roman Catholic and the Reformed Church. He had all along inclined to the side of the Reformed; but he had not yet relinquished his connection with the ancient church. The result of this examination was a perfect conviction that many of the Roman doctrines were erroneous, and the discipline of the church depraved and perverted; and consequently that separation was imperative upon all who had any regard to the Word of God; and no sooner did he arrive in Scotland than he acted accordingly.

As Buchanan's connection with the Marshal de Brisac terminated in 1560, when the civil wars in France had already begun, he probably returned immediately to Scotland, though the exact period has not been ascertained. He had courted, while he resided in France, the notice of Mary, future queen of Scots, by an Epithalamium on her marriage with the dauphin; and in January, 1561-62, we find Randolph, the English ambassador, writing thus from

Edinburgh to his employers:—"There is with the queene [Mary] one called George Bowhanan, a Scottishe man very well learned, that was Schollmaster unto Monr, de Brisack's son, very Godlye and honest". And in a subsequent letter, dated from St. Andrews, he says, "The queene readeth daylie after her dinner, instructed by a learned man, Mr. George Bowhanan, somewhat of Livy". Buchanan took occasion to express his attachment to his royal pupil in a highly-finished copy of Latin verses prefixed to his translation of the Psalms, which he had just finished, and sent to the press of his friend Henry Stephens. Mary, in return for this compliment, and as a reward for his services, bestowed upon her preceptor and poet, in 1564, the temporalities of the Abbey of Crossraguel. These temporalities, valued at £500 Scots a year, he held till the day of his death. Buchanan, however, sedulously cultivated the friendship of the leaders of the Reformation. In the same year in which he was promoted to the temporalities of Crossraguel, he prepared for the press a collection of pieces, entitled *Fraternitas Fraterrimi*, in which the monks and other ecclesiastics were assailed with the keenest irony and the most vehement invective. He also put the finishing hand to his *Franciscanus* (The Franciscan), which he published with a dedication to the Earl of Moray. Through the interest of this nobleman Buchanan was nominated to be principal of St. Leonard's College, St. Andrews, in 1566. Next year he was chosen moderator of the General Assembly, the only instance of the chair being held by a layman.

When Elizabeth thought fit to appoint commissioners, and call witnesses from Scotland, for the purpose of substantiating the charges upon which Mary had been expelled from the throne, the main burden of the proof was devolved upon Buchanan. He accompanied the Regent Moray into England upon that occasion, and it appears impossible to absolve him from the charge of being a willing assistant in Moray's unfair procedure against Mary. Some even accuse him of forging the celebrated Casket Letters. (See MARY STUART.) In 1571 he published in Latin a Detection of Mary's Actions, based on the Book of Articles which Moray presented at the conference. The assassination of the Regent Moray, soon after his return from England, threw the nation into a ferment, and Buchanan, strongly suspicious of the selfish policy of the Hamiltons, addressed 'An Admonition direct to the trew lordis maintainaris of justice and obedience to the kingis grace', in which he earnestly adjured them to protect the young king and the children of the late regent from the perils that seemed to impend over them. The same year he composed a satirical delineation of the character of the secretary Lethington, entitled *Chameleon*, which, through the vigilance of the secretary, was prevented from being published at the time. A copy, however, was preserved among the Cotton MSS., dated 1570, and it was printed at London in 1710, in the *Miscellanea Scotica*. It has often been reprinted since. These two pieces appear to be all that he ever composed in his vernacular tongue, and they are of such excellence as to make it matter of regret that he did not turn his attention oftener to the cultivation of his native language. Buchanan was, in 1570, selected by the lords of the privy-council to take the superintendence of the education of King James; and the respectable scholarship which his pupil exhibited in after life shows that he executed his task with success. At this time he was also appointed director of the chancery; but this post he does not appear to have long held. The same year he was made keeper of the privy seal. This office, both honourable and lucrative, and which entitled him to a seat in Parliament, he held for several

years. It was principally by his advice and that of Sir Alexander Erskine that Morton was deposed, and the reins of government put into the king's hands, when he was only in his twelfth year. He was a member of the privy-council appointed for the young monarch, but seems to have been displaced on Morton's return to power; and we are uncertain if he ever again held any political office.

In 1578 he prepared his *Baptistes*, and dedicated it to the young king, with a freedom of sentiment bordering upon disrespect. Three years after, in 1579, he published his compendium of political philosophy, entitled *De Jure Regni apud Scotos*, a work which will ever rank him among the spirited defenders of the rights of the people to judge of and control the conduct of their governors. He also compiled his life at the request of his friends, when he had reached his seventy-fourth year, and his epistolary correspondence, which was at one time very extensive, was still continued with some of the friends of his earlier days.

It is doubtful whether he lived to see his *History of Scotland* ushered fairly into the world or not. The dedication to the king is dated August the twentieth, 1582, only thirty days before the death of the author, which happened on Friday, the 28th of Sept. following, when he had reached the age of seventy-six years and eight months. Notwithstanding the many public situations he held in his lifetime, such was the extent of his charities, that he died poor, and was buried at the expense of the city of Edinburgh, in the Gray Friars Churchyard, a great multitude attending his funeral. In 1584, two years after its publication, the history was condemned, along with *De Jure Regni*, by the Parliament of Scotland, and every person possessed of copies commanded to surrender them within forty days, in order that they might be purged of the offensive and extraordinary matters which they contained.

Buchanan during his life was a violent and often virulent partisan; and his character, therefore, has been differently estimated according to the political and religious views of the writers. As a Latin poet and historian, however, there can be but one opinion of his excellence. In the former department no modern Latinist has approached him in harmony and splendour of diction; in the latter department he is said to unite the beauties of Livy and Sallust as to style, though in other respects he shows a lack of judgment in taking up all the tales of old chronicles as he found them, and affording to their legendary absurdities the currency of his own eloquent embellishment. Perhaps, after all, it is as a political writer that the world is chiefly indebted to him, for he was among the first to combat the old axiom of the 'divine right of kings,' and to expound the true rights and privileges of the subject. Of Buchanan's works there are two collective editions, one by Ruddiman (Edinburgh, 1715, two vols. folio), and one by Burmann (Leyden, 1725, two vols. 4to). See his *Life* by Dr. Irving, and that by P. Hume Brown.

BUCHANAN, JAMES, the fifteenth president of the United States of America, was born in Pennsylvania, 22d April, 1791; died in the same state on 1st June, 1868. His father was by birth an Irishman, who had quitted Europe in 1783, and established himself in a farm at Stony-Batter. James Buchanan was educated at Dickinson College, Carlisle, where he graduated; subsequently entered the office of James Hopkins of Lancaster to study law, and was admitted to the bar in 1812. In 1814 he was elected to the legislature of Pennsylvania, and in 1820 was sent to Congress, of which he continued a member till 1831, being re-elected four times. He then entered the career of diplomacy, being charged by President

Jackson with a special mission to Russia for the conclusion of a commercial treaty. On his return, in 1823, he was elected to the Senate. About this time the anti-slavery agitation began to assume importance. Buchanan wished to prevent the agitation slackening Congress, by declaring its incompetency to deal with it. He held that constitutionally it was a question for the individual states, and that it was better for all parties, even for the slaves themselves, that it should remain so. Under the presidency of Polk, 1845-49, Buchanan was intrusted with the functions of secretary of state. The annexation of Texas and the war with Mexico were the chief events of his administration. During the presidency of General Taylor he retired from public life. In 1853 General Pierce, on being elected president, named him ambassador of the United States at London. He held this appointment till 1856. The Central American boundary and the project of the annexation of Cuba were the principal subjects discussed during his embassy. While maintaining with ability the views of his own country, he gained the esteem of that to which he was deputed by the prudence and moderate tone of his diplomacy. He returned to America in 1856, being chosen as candidate for the presidency by the Democratic party. He was elected by a large majority over Fremont, the Republican candidate, and inaugurated in March, 1857. His foreign policy inclined to the aggressive views he had always advocated, but the questions of slavery and state-rights were at this period approaching a crisis which made home administration of much greater importance. By his pro-slavery views, and the firmness and moderation of his character, Buchanan succeeded in delaying the storm which burst out on the election of his successor Lincoln. His character for statesmanship, however, suffered from his vacillation in dealing with the first measures of the seceders; but it must be considered that the position of a ruler holding office as the viceroy of his successor is not favourable to a vigorous administration in a difficult crisis. He supported the administration of Lincoln, and lent his influence to the vigorous prosecution of the war.

BUCHANITES, a sect of enthusiasts who sprung up at Irvine, in the w. of Scotland, about the year 1788. Mr. White, the minister of a congregation of the Relief Church in that town, having been invited to preach in the neighbourhood of Glasgow, a female named Elizabeth Buchan, the wife of a painter, was captivated with his eloquence, and writing to him, announced that he was the first who had spoken to her heart, and requested permission to pay him a visit at Irvine, that the work of her conversion might be perfected. On her arrival she was joyfully received by the members of the congregation, engaged without intermission in religious exercises, went from house to house, conducted family worship, answered questions, resolved doubts, explained the Scriptures, and testified that the end of the world was at hand, and that it was the duty of every Christian to abandon the concerns of time and prepare for the reception of Christ. Mr. White, favouring her and her views, was complained of to the presbytery, by which he was deposed from his ministry. Thus a distinct party was formed, the meetings of which were commonly held at night, and on these occasions the new prophetess indulged in her reveries, styling herself the Woman of the Twelfth of Revelations, and Mr. White her first-born. Such gross outrage on the common sense of the inhabitants occasioned a popular tumult, to save her from the fury of which the magistrate sent her under escort to some distance; after which, with her clerical friend, and about forty deluded followers, she wandered up and down the country, singing, and avowing that they were travellers for the New Jeru-

salom, and the expectants of the immediate coming of Christ. They had a common fund on which they lived, and did not consider it necessary to work, as they believed God would not suffer them to want. Mrs. Buchan died in 1792, and the sect soon after broke up.

BUCHAREST, or **BUKAREST** (Roumanian, *Bucuresti*, that is, 'city of joy'), formerly the chief city of Walachia, now the capital of the kingdom of Roumania, on the Dimbovitza, 37 miles from its mouth. It is the most populous city of south-east Europe after Constantinople and Budapest, and is spoken of by the Roumanians as the Paris of the East. Besides being the seat of government, Bucharest is the residence of a Greek archbishop. The appearance of the town is very peculiar. The houses are mostly of one story, built of brick, pointed externally, and have metal roofs. The streets are mostly narrow and crooked, but though not well kept they are now generally paved and lighted with gas. The most important of them are the Boulevard, running from east to west, the Calea Victoriei, the Lipscani, and the Karlstrasse. There are statues to Joan Heliade-Radulescu, the father of Roumanian literature; George Lazar; and others. Numerous bridges, some of iron and some of stone, cross the Dimbovitza, a small muddy stream that formerly caused a good deal of damage by inundations. From 1865 till 1896 extensive fortifications were erected. The inhabitants nearly all belong to the Greek Church. The churches are very numerous, but few of them are architecturally noteworthy; the chief being the metropolitan cathedral, built in 1666, restored in 1834, and standing on a hill, and the Roman Catholic cathedral, built in 1876-84, one of the chief ornaments of the city. Bucharest has a university with four faculties, and connected with it a public library and a museum of natural history and antiquities. There are four lycées, two gymnasia, some technical and military schools, a conservatory of music, some girls' schools, and other educational institutions. There are a few fine public buildings, of which the most conspicuous is the royal palace, recently rebuilt; among the others being the new Palace of Justice, the National theatre, the atheneum, the post-office, and several fine hotels. What chiefly distinguishes Bucharest is the magnificence of the public gardens. There is a mixture in the population of eastern habits, with European civilization among the upper classes. The manufactures comprise iron goods, earthenware, leather, linen, soap, paper, beer, &c., but they are of no great importance. There is an active trade, Bucharest being an entrepôt both for the kingdom of Roumania and for adjacent countries. It imports manufactured goods, and exports grain, wool, honey, wax, tallow, and cattle, the produce of the country. In 1698, when it became the capital of Walachia, it was only a village. It was pillaged by the Servians in 1716; taken by the Russians in 1769 and 1806; occupied by them again in 1828-29 and 1853-54; by the Austrians in 1774, 1789, and 1854; was partly destroyed by fire in 1847; and became the capital of Roumania in 1862. A peace congress was held here in 1772-73, and another in 1812 (see below), and in 1886 peace was concluded here between Servia and Bulgaria. Pop. (1894), 232,009.

BUCHAREST, **PEACE** OF, May 28, 1812, between Russia and the Porte. In November, 1806, the Emperor Alexander took up arms for the protection of Moldavia and Walachia, and on account of the violation of the free navigation of the Bosphorus. He occupied Moldavia, upon which the Porte declared war against Russia, January 7, 1807. An armistice, however, was agreed upon at Silobosia, August 24, 1807, and after the expiration of the truce in April, 1808, it was

tactically continued; but in April, 1809, the war was renewed. The Russians advanced to Bulgaria, and after two bloody campaigns remained masters of the Danube. The Porte now offered terms of peace. A congress was opened at Bucharest in December, 1811. Napoleon did all in his power to induce the Porte to continue the war; but the interposition of Great Britain and Sweden, as well as the concessions of Russia, and the distrust of the Porte towards Napoleon, brought to a conclusion the Peace of Bucharest, which was signed May 28. The Porte gave up to Russia all Bessarabia and a third of Moldavia, with the fortresses of (Ioczim, Bender, Ismail, and Kilia, so that the Pruth, as far as its confluence with the Danube, became the boundary between the two powers, and from thence the left bank of the Danube as far as Kilia, and even to its entrance into the Black Sea. The Russians gave back the rest of their conquests. In Asia the boundaries were established as before the war. The boundary then settled between Russia and Turkey was modified in favour of the Porte at the Peace of Paris, 30th March, 1856. See **PARIS** (TREATIES OF).

BUCHARIA. See **BUKHARA**.

BUCHER, **ANTON VON**, a well-known and much-esteemed Catholic writer against the Jesuits, was born in Munich, Jan. 8, 1746, educated in the Latin schools of the Jesuits, studied at Ingolstadt, and was consecrated priest in 1768. He died in 1817. In his different offices as a public teacher he did a great deal in his day to instruct and enlighten his country. His contributions to the history of the Jesuits in Bavaria (*Beiträge zur Geschichte der Jesuiten in Baiern*) are of great historical value. His works were published in six vols., Munich, 1819, & seq.

BUCHÉZ, **PHILIPPE JOSEPH BENJAMIN**, French physician and writer, was born 31st March, 1798, at Matagne, a village of the department of Ardennes. After finishing his education at Paris he gave himself up to the study of the natural sciences, and in particular to medicine, receiving his doctor's degree in 1825. He was bitterly hostile to the government of the restoration, and was one of those who, in 1821, founded the French society of Carbonari. He became chief editor of the *Journal des Progrès des Sciences et Institutions Médicales*, and in 1826 assisted in editing the *Producteur*, a weekly paper which advocated the doctrines of Saint-Simonism. As his views ceased to coincide with those of his colleagues, however, he withdrew from the *Producteur*, and in 1831 founded a journal of moral and political science, called *L'Européen*, in which he expounded those doctrines which owe their origin chiefly to himself, and have been collectively denominated 'Buchézism'. The fundamental idea of his system is that of the progress and development of the human race. But progress presupposes an aim, and this aim must be pointed out beforehand, or *revealed*. Thus the idea of progress leads him to the orthodox belief in revelation. This theory is worked out in his *Introduction à la Science de l'Histoire* (Paris, 1833, 2nd edition, 1842), and his *Essai d'un Traité Complet de Philosophie au Point de Vue du Catholicisme et du Progrès* (1839). Along with his favour for the Catholic Church he still retained his strong democratic and republican opinions, and in concert with M. Roux-Lavergne published *Histoire Parlementaire de la Révolution Française, ou Journal des Assemblées Nationales*, depuis 1789 jusqu'en 1816 (forty vols., Paris, 1833-38). After the revolution of 1848 he was elected to the constituent National Assembly, of which he was soon appointed president. This post he did not retain beyond the disturbance of the 15th May, on which occasion he manifested the utmost weakness and indecision. Thenceforth he held aloof

from public life, prosecuting his studies and writing several works, among which we may mention *Histoire de la Formation de la Nationalité Française* (two vols. Paris, 1869). His death took place in Aug. 1865.

BUCHON, JEAN ALEXANDRE, a distinguished French historical writer, was born 21st May, 1791, at Mâcon-Salon, in the French department of Cher. Having gone to Paris, he became collaborateur on several liberal journals, and early took part in the opposition to the restoration. He was in consequence several times prosecuted by the government, and his writings, such as his *Vie de Tasse* (Paris, 1817), were interdicted. In 1821 he gave a course of lectures in the Athenæum on the history of dramatic art in England; and in the following years he travelled over the greater part of Europe for the purpose of collecting documents to illustrate the history of France during the middle ages. After his return he published his *Collection des Chroniques Nationales Françaises, écrites en Langue Vulgaire du XIII^e au XV^eme Siècle* (forty-seven vols. Paris, 1824-29), which he began with the *Chroniques de Froissart* (fifteen vols. 1824-26). These chronicles were accompanied with biographical notices and with critical and other notes, as were also those which he edited for the *Panthéon Littéraire*. Among the latter are *Chroniques Étrangères relatives aux Expéditions Françaises pendant le XIII^e Siècle* (Paris, 1840). He was appointed inspector of the archives and libraries of France in 1828, and in 1829 inspector-general of the departmental and communal archives; but he soon lost his office through a change of ministry. The revolution of July (1830) did not reinstate him in his position, and he returned with new ardour to his historical and literary labours. He died April 30, 1846. In addition to the works of this indefatigable writer already mentioned, we may notice his *Histoire Populaire des Français* (Paris, 1832); *La Grèce Continentale et la Morée* (1843); and his *Histoire des Conquêtes et de l'Établissement des Français dans les États de l'ancienne Grèce sous les Valles-Hardouin* (1846), besides his editions of Brantôme, &c., and his articles in cyclopedias and magazines.

BUCK, the male of the fallow-deer, also of rabbits and other animals.

BUCK-BEAN, BOG-BEAN, or MARSH-TREFOIL (*Menyanthes trifoliata*), a beautiful British plant belonging to the Menyanthes, a subdivision of the natural order of the Gentianaceae. It is common in spongy, boggy soils, and besides inhabiting Britain is found throughout Europe as well as in Siberia and North America. It flowers in Britain about the latter end of June. It has a procumbent stem rising to a height of 6 or 12 inches, and covered by the sheaths of the leaves, and a creeping jointed root. The leaves are trifoliate (like those of clover), with obtuse, ovate leaflets. The flower-stalk terminates in a thyrse of white flowers, rose-coloured outwardly. The calyx is five-parted, the corolla funnel-shaped, spreading, and clothed on the inner surface with a coating of dense fleshy hairs. The fruit consists of a one celled, two-valved capsule containing numerous seeds. The whole plant, the root especially, has an intensely bitter taste, and an extract of it ranks as a valuable tonic quite equal in its effects to gentian. It is not so frequently employed now, however, as it used to be. It is said to be beneficial in intermittent fevers, gout, liver complaints, dropsy, scurvy, &c. In the *x.* of Europe it is sometimes used instead of hops to give bitterness to beer; and in Lapland an unpalatable kind of bread is made from the powdered roots.

BÜCKEBURG. See **LIPPE**.

BUCKETS, in water-wheels, are a series of cavities into which the water is delivered, on the circumference

of the wheel to be set in motion. By the revolution of the wheel the buckets will be alternately erected so as to receive water and inverted so as to discharge it; the loaded side will descend, and present the empty buckets in succession to the current, and thus keep up a constant revolution of the wheel.

BUCKINGHAM, or BUCKS, an inland county, England, bounded N. and N.W. by county Northampton; N.E. and E. by counties Bedford and Hertford; S.E. by Middlesex, S.W. by county Berks, and W. by Oxford; its length, N. to S., is about 45 miles; greatest breadth, E. to W., 28 miles; area, 479,360 acres, of which 440,000 are supposed to be arable. The vale of Aylesbury, stretching through the centre of the county, and celebrated for its fertility, furnishes rich pasturage for vast numbers of cattle and sheep. The soil in this part of the county is a strong clay loam, varying in depth from 2 feet of rich staple, to only a few inches incumbent on stiff clay. But though well adapted for grazing, it is not considered suitable for tillage, and the portion, therefore, under the plough is very small. In this district, as well as over a great portion of the county, the tenures are principally from year to year—a system which is looked upon with considerable favour by most of the tenants. There are few large farms in the county, generally they incline to be small or of medium size.

Agriculture is perhaps in a more backward state in Buckinghamshire than in some other English counties, but improved methods of culture, new implements, such as reaping and mowing machines and the steam plough, as well as artificial manures are now employed, and plenty of excellent farming is to be met with. The total area under all kinds of crops, bare fallow and grass is somewhat more than 400,000 acres, of which considerably more than half is in permanent pasture. The chief cereal crops are wheat, barley, and oats, each occupying annually from about 22,000 to 30,000 acres; but here, as elsewhere in recent years, corn crops have diminished in area, while pasture has increased. Dairying is much practised. Between 4,000,000 and 5,000,000 lbs., or about 1800 tons of butter, are annually made in this county, the greater part of which is sent by contract to London. Milk and cream cheeses are also made for the London market, and large numbers of calves are sold. Pigs and ducks are reared in great numbers; the former more especially on the dairy farms, where they are fed on skim and butter milk. The breeding and fattening of cattle are largely carried on, and much attention is now paid to the quality and purity of the stock. Herefords and short horns are favourite breeds. The breeding of horses is also carried on with success, many of these being for the London market.

The manufactures of Buckinghamshire are unimportant, among them being straw-plaiting and the making of thread lace, which furnishes employment to a number of females and children; the making of wooden articles, such as beechen chairs, turnery, &c. is carried on; there are also paper-mills, silk-mills, &c. The mineral productions of this county are of no great importance. The county is watered by the Ouse, the Thames, and the Thames; and is intersected by the London and North-Western Railway, and part of the Great Western system. The county of Buckingham comprises eight hundreds. Those of Stoke, Burnham, and Desborough are known as 'the Chiltern Hundreds.' Buckingham is nominally the county town, but Aylesbury is the real town. Buckinghamshire used to contain three parliamentary boroughs, namely, Aylesbury, Buckingham, and High or Chipping Wycombe, which now give name to corresponding parliamentary divisions. The county

thus returns three members to the House of Commons, but no separate borough representatives. Pop. in 1891, 185,384; in 1901, 195,534.

BUCKINGHAM, a municipal and formerly a parli. borough of England, capital of the county of its own name, 50 miles N.W. of London, on a branch of the London and North-Western Railway. It is pleasantly situated on a peninsula formed by the Ouse, which almost encompasses the town, and is here crossed by three stone bridges. The houses are mostly of brick; the streets straggling and irregular, paved, and lighted with gas. The town-hall and jail are large and commodious buildings. The church, erected in 1781, is a specious structure, with a square tower, surmounted by an elegant spire; and there are, besides, places of worship for Independents, Wesleyans, and the Society of Friends; also a free grammar-school, founded by Edward VI.; and several almshouses. The manufacture of lace, formerly carried on here to some extent, of late years has greatly declined if not altogether ceased. Malting and tanning are carried on to some extent; and a good deal of business is done in wool and hops. In the vicinity are several limestone quarries, and one of marble. The borough formerly returned two members to the House of Commons, but was deprived of one of them by the Reform Act of 1867, and of the other by that of 1885. Buckingham formerly gave the title of duke to the family of Temple. Pop. in 1881, 3585; in 1891, 3364; in 1901, 3151.

BUCKINGHAM, GEORGE VILLIERS, DUKE OF, the unworthy favourite of James I. and Charles I. of England, was born, 1592, at Brookeby, in Leicestershire, of a family which came thither from Normandy in the time of William the Conqueror. His father was George Villiers, Knight; his mother was descended from the ancient family of Beaumont. His father died when he was thirteen, and at eighteen years of age he was sent to France, where he resided three years, and acquired great skill in all bodily exercises. This, together with his beauty of person and graceful manners, made so great an impression on James I., who gave him the familiar name of Steenie, that in less than two years he was made a knight, a gentleman of the bed-chamber, baron, viscount, Marquis of Buckingham, lord high-admiral, lord warden of the Cinque Ports, &c., and at last dispenser of all the honours, offices, favours, and revenues of the three kingdoms, according to the dictates of his ambition, his cupidity, and his caprice. Thenation was indignant at seeing merit undervalued, the people trampled upon, the nobility humbled, the crown impoverished and degraded, to elevate and enrich a weak and insolent favourite. Such rapid and undeserved promotion likewise caused many private jealousies, and his character was freely, and probably in some respects falsely, aspersed. In 1623 he engaged in a romantic adventure with Charles, Prince of Wales, in connection with which traitorous views have been attributed to him. The Earl of Bristol was negotiating a marriage for the prince with the Infanta of Spain. Buckingham persuaded the prince to go to Madrid, and carry on his suit in person. They set out incognito, passed through various adventures, and saw on their way the Princess Henrietta Maria of France, whom Charles afterwards married. The result of this journey is well-known. The marriage was broken off, was declared with Spain, and Bristol was impeached. Buckingham was created a duke during his absence, and whatever misconduct may have been associated with the design or execution of his mission, his favour with the king and prince remained unimpaired. James died in March, 1625, and in May of the same year Buckingham was sent to France as

proxy for Charles I., to marry the Princess Henrietta Maria. In the following year the unpopularity of the war with Spain, and the failure of the expedition to Cadix, caused his impeachment, from the consequences of which he was saved by his favour with the king. His intrigues soon after brought on a war with France, and he was intrusted with an expedition to succour the Rochellois, but they refused his aid, and he carried his forces to the Isle of Rhé, where, after three months spent in unskilful operations, he suffered a defeat in re-embarking which cost 2000 men. Notwithstanding this proof of incapacity, a large force was again intrusted to him to renew the attempt on Rochelle. He went to Portsmouth to superintend the preparation, and while there he was assassinated, Aug. 24, 1628, by John Felton, a lieutenant who had withdrawn from the army in consequence of being disappointed of promotion.

BUCKINGHAM, GEORGE VILLIERS, DUKE OF, son of the preceding, was born at Wallingford House, in Westminster, Jan. 30, 1628. After studying at Trinity College, Cambridge, he travelled abroad, and on his return home, after the commencement of the civil war, he was presented to the king at Oxford. He served in the royal army, under Prince Rupert and Lord Gerard. His estate was seized by the Parliament; but having obtained the restoration of it, he travelled with his brother into France and Italy. In 1648 he returned to England, and was with Charles II. in Scotland, and at the battle of Worcester. He followed that prince abroad, and served as a volunteer in the French army in Flanders. He afterwards returned to England, and in 1657 married the daughter of Lord Fairfax, by which means he repaired the ruin of his fortune in the royal cause. He, however, preserved the favour of Charles II., and at the Restoration was made master of the horse. He also became one of the king's confidential ministers, who were designated by the appellation of the *cabal* (1667-73). His political conduct was, like his general behaviour, characterized by unprincipled levity and imprudence. In 1666 he engaged in a conspiracy to effect a change of the government; notwithstanding which, he recovered the favour of King Charles, which he repeatedly abused. The profligacy of his private life was notorious. He seduced the Countess of Shrewsbury, and killed her husband in a duel; and he was more than suspected of having been the instigator of the infamous Colonel Blood to his brutal outrage against the Duke of Ormond, whom he attempted, with the assistance of other ruffians, to carry to Tyburn, and hang on the common gallows. In 1677 he was, together with the Earls of Shaftesbury and Salisbury and Lord Wharton, committed to the Tower for a contempt, by order of the House of Lords; but, on petitioning the king, they were released. After plotting against the government with the Dissenters, and making himself an object of contempt to all parties, he died at Kirkby Moor, in Yorkshire, April 16, 1687. Pope (*Moral Essays*, epistle 8rd) has more strikingly than accurately described his death. His abilities were far superior to those of his father; and among his literary compositions, the comedy, or rather the witty burlesque, of the *Rehearsal* may be mentioned as a work which displays no common powers, and which greatly contributed to the correction of the public taste, which had been corrupted by Dryden and others.

BUCKINGHAM, JAMES SILE, a noted traveller and lecturer, was the son of a seafaring man in the village of Flushing, near Falmouth, and was born there in 1786. He attended school at Falmouth, and having early manifested a great predilection for the sea, made three voyages to Lisbon while yet a mere

boy. On the last of these he was taken captive with the ship, and detained a prisoner for some time in Spain, but was ultimately liberated and returned to England. He then entered the employment of a bookseller and nautical instrument maker at Devonport, where he continued for three or four years; but at last, urged by a sudden whim, set off again to sea, and almost as quickly deserted and returned to his friends. He then betook himself to the study of law, but his fickle temper led him soon to abandon that also, and though not yet twenty years old, he got married, and set up a shop for the sale of books and nautical instruments. This also proved an unfortunate speculation, and the young adventurer proceeded to London in the hopes of obtaining an appointment on board a West Indiaman, which he at last succeeded in doing; but while waiting for it had to work as a printer in order to support himself and make remittances to his wife and child. As captain or chief officer he made several voyages to the West Indies, and afterwards quitted this line for a similar employment in the Mediterranean trade. He then resolved to settle at Malta as a ship-owner and merchant, but this project was frustrated by adverse circumstances, and he set off to try his fortunes in Egypt. He succeeded in obtaining from Mohammed Ali a commission to examine the isthmus of Suez, and report on the practicability of carrying a canal through it from the Red Sea to the Mediterranean. Nothing definite was accomplished in this matter, and the pasha then gave Buckingham a commission to purchase ships for him in India, and encourage a trade between that country and Egypt. With this view he proceeded to Bombay, and arrived there in 1815, but found strong prejudices existing against Mohammed Ali, and an unwillingness to have anything to do with him, and he accordingly accepted the command of a ship belonging to the Imaum of Muscat, with the view of trading to China on behalf of that potentate. On this intention becoming known to the authorities at Bombay, and also the circumstance that he had no license from the East India Company to reside in India, he received orders to return to England, but after considerable difficulty was at last allowed to return to Egypt in one of the Company's ships. Here he had another interview with the pasha, who furnished him with a firman and other assistance, by means of which he effected an overland journey to India, through Syria, Mesopotamia, and Persia. In 1816 he established a journal in Calcutta, but the censorship of the press was then in full force in India, and Buckingham, having offended government by the boldness of his animadversions, his printing-presses were seized, and he himself compelled to quit the presidency of Bengal and return to England. On his arrival there a subscription was set on foot to reimburse him for the losses which he had sustained by the proceedings of the Indian government, and about this time he began to deliver lectures in London on behalf of free-trade to the East, and the extinction of the East India Company's monopoly. He also established the *Athenæum*—well known as a literary journal—and prepared for the press the manuscript journals of his travels. In 1822 appeared *Travels in Palestine*; in 1825, *Travels in Arabia*; in 1827, *Travels in Mesopotamia*; and in 1830, *Travels in America and Media*. In 1832 he was chosen member of Parliament for Sheffield, and retained his seat till 1837. Subsequently to this he made a tour of three years in America, resulting in the publication of eight volumes on the United States, and one on British North America. A great part of these is occupied by statistics and other ponderous matter—a circumstance which is generally characteristic of Buckingham's books of travel. In 1848 he

became secretary to the British and Foreign Institute—a literary club which he had mainly contributed to form; but in this capacity he unfortunately drew upon himself the animadversions of Fumich, which at last fairly extinguished the society. In the latter years of his life his principal occupation was delivering lectures in various parts of the country, and, from his choice of subjects and popular and pleasing style, they were attended with considerable success. He was a zealous promoter of the temperance cause, and president of the London Temperance League. In 1849 appeared his *National Evils and Practical Remedies*. He has also published two vols. on Belgium, the Rhine, and Switzerland, and two on France and Piedmont, the result of tours on the Continent. His last work was his *Autobiography*, the first two vols. of which appeared in 1856, but its completion was prevented by the author's death on 30th June of that year. A few years before his death the East India Company granted him a pension, which was afterwards continued to his widow, and he had also a pension of £200 a year from the civil list.

BUCKINGHAM PALACE. See LONDON.

BUCKLAND, REV. WILLIAM, D.D., an eminent geologist, was born at Axminster, in Devon, in 1784, and was educated first at Winchester, and afterwards at Corpus Christi College, Oxford. He took his degree of B.A. in 1808, and obtained a fellowship in 1808. From early childhood he had been familiar with the ammonites and other fossils in the lias quarries near his native town, and with advancing years the bent of his mind to geological pursuits was developed and confirmed. In 1818 his known abilities in this department procured him the appointment of reader in mineralogy at Oxford, and so well did he maintain and extend his reputation, that in 1818 a new readership, that of geology, was bestowed on him, having been expressly instituted on his behalf. In 1820 he delivered before the University of Oxford a lecture, which was afterwards published under the title of *Vindiciæ Geologicæ, or the Connection of Religion with Geology Explained*. In the course of his geological rambles throughout England his interest had been largely excited by the examination of the deposits of animal remains in caves in various parts of the country. To these he was the first to direct public attention; and on the discoveries then made by him, and the disclosures thereby afforded of the animals inhabiting England in the pre-historic era, the fame of Dr. Buckland as a geologist more especially resta. A paper contributed by him to the *Philosophical Transactions* in 1822, entitled, *Account of an Assemblage of Fossil Teeth and Bones of Elephant, Rhinoceros, Hippopotamus, Bear, Tiger, and Hyæna, and Sixteen other Animals, discovered in a Cave at Kirkdale, Yorkshire, in the Year 1821*, procured for him the Copley medal; and on this was subsequently founded his *Reliquiæ Diluvianæ, or Observations on the Organic Remains attesting the Action of an Universal Deluge*, published in 1828. In 1825 he was presented by his college to the living of Stoke Charity, near Whitehurst, Hants, and the same year he became one of the canons in the Christchurch Cathedral, Oxford. He also about this time married Miss Mary Morland, of Abingdon. In 1832 he acted as president at the second meeting of the British Association for the Advancement of Science, and read numerous papers before that body at different times. Dr. Buckland was one of the eight selected to write the celebrated *Bridgewater Treatises*, and in 1836 his essay was published, under the title of *Geology and Mineralogy considered with Reference to Natural Theology*. On the recommendation of Sir Robert Peel he was made, in 1845, Dean of Westminster, and in 1847 was appointed one of the trus-

tees of the British Museum. About 1840 he began to exhibit symptoms of mental aberration, which terminated in a hopeless imbecility. He died at Clapham, near London, on 14th August, 1856. Besides the works above indicated, he contributed an immense number of papers to various societies and periodicals. A memoir of him has been written by his son, and prefixed to an edition of his *Bridge-water Treatise*. He was a fellow of the Geological Society from 1818, and of the Royal Society from 1818.

BUCKLE, HENRY THOMAS, an eminent historical writer, was born on 24th November, 1822. He was the son of a wealthy merchant, and received his education partly at home, and partly at Dr. Hallowsay's School, Gordon House, Kentish Town. His delicate health prevented his remaining long at school, but his love of learning and indefatigable industry as a student supplied any deficiencies in his training, and he was to a great extent self-educated. At an early age he entered his father's counting-house, but he displayed no aptitude for business; and when at the age of eighteen his father's death left him an ample fortune, he devoted himself entirely to study. The only thing he allowed to distract him from his more serious pursuits was his favourite game of chess, in which he attained much excellence as to be recognized as one of the first English masters of the game; but even this he gave up when he found it encroached too much on his time. He had formed a plan, to which he dedicated his life, of writing the *History of Civilization in England* in conformity with certain philosophical principles, and with an exhaustive treatment in regard to details which he deemed indispensable to historical accuracy, which made the work he had undertaken one of almost incalculable magnitude. He only succeeded in finishing two volumes; the first, published in 1858, stated with copious illustrations the plan of the work; the second, issued in 1861, contained a digression on the histories of Scotland and Spain, intended further to illustrate his design, and demonstrate the principles on which it was based. These works gave rise to much controversy, but it has been generally agreed that they exhibit great boldness and originality of design, with profound and accurate scholarship, and possibly also with a good deal of what was the object of the historian's strongest aversion in others, dogmatism. He died at Damascus on 29th May, 1862, when on a voyage undertaken for the restoration of his health.

BUCKLER. See **SHIELD**.

BUCKTHORN (*Rhamnus cathartica*), a shrub, native of Britain, usually found in woods and hedges, nat. order Rhamnaceae. The stem is covered with a dark-brown bark, and divides into numerous branches with strong spines. It grows to 7 or 8 feet. The leaves are elliptical and serrated. The male and female flowers are on different plants. The calyx is of a greenish yellow. There is no corolla. The fruit is a round black berry, containing four seeds. It flowers in May, and the seeds ripen in September. The berries are medicinal. They form a powerful purgative, but being harsh in action are seldom used in modern practice. The juice of the ripe berries, mixed with alum, forms the sap-green of artists. The bark yields a beautiful yellow dye.

BUCKWHEAT, or BRANT (*Polygonum fagopyrum*), a plant of the order Polygonaceae, with branched herbaceous stem, somewhat arrow-shaped leaves, and purplish-white flowers, growing to the height of about 30 inches, and bearing a small triangular grain of a brownish-black without and white within. The stalk is round and hollow, generally green, but sometimes tinged with red. It is jointed, with lateral branches growing out at the joints. Buckwheat was first

brought to Europe from Asia by the Crusaders, and hence in France is often called *Saracen corn*. It is cultivated in China and other eastern countries as a bread corn. It is sown here in May or June, and ripens rapidly, thriving in the poorest soil. The flowers appear about July, and the seeds ripen in October; but so tender are the plants that a single night's sharp frost will destroy a whole crop. As a grain, buckwheat has been principally cultivated for oxen, swine, and poultry; and although some farmers state that a single bushel of it is equal in quality to two bushels of oats, others assert that it is a very unprofitable food. Mixed with bran, chaff, or grain, it is sometimes given to horses. The flour of buckwheat is occasionally used for bread, but more frequently for the thin cakes called *crumpets*. In Germany it serves as an ingredient in puddings, and other food. In Pennsylvania it is very extensively used throughout the winter in cakes, which are cooked upon a gridiron. Beer may be brewed from it, and by distillation it yields an excellent spirit. It is used extensively in Danzig in the preparation of cordial waters. The best mode of harvesting this grain is said to be by pulling it out of the ground like flax, stripping off the seeds with the hand, and collecting these into aprons, or cloths tied round the waist. Buckwheat is much cultivated by the preservers of game as a food for pheasants. If left standing it affords both food and shelter to the birds during winter. With some farmers it is the practice to sow buckwheat for the purpose only of ploughing it into the ground as a manure for the land. The best time for ploughing it in is when it is in full blossom, allowing the land to rest till it decomposes. Whilst green it serves as food for sheep and oxen, and mixed with other provender it may also be given with advantage to horses. If sown in April two green crops may be procured during the season. The blossoms may be used for dyeing a brown colour. It is frequently cultivated in the Middle United States of America and also in Brabant, as food for bees, who are very fond of it, and to whose honey it imparts a flavour by no means unpleasant. The principal advantage of buckwheat is that it is capable of being cultivated upon land which will produce scarcely anything else, and that its culture, compared with that of other grain, is attended with little expense.

BUD. Buds are modified shoots in which, owing to the non-development of the axis, the lateral organs become crowded together. They contain the rudiments of future organs, as stems, branches, leaves, and organs of fructification. The usual form of a bud is an elongated ovoid, and according to their position they are described as *terminal*, that is, formed at the end of a branch, or *axillary*, that is, produced in the axils of a leaf. Besides the rudimentary organs found in the interior, buds are in cold or temperate climates often covered externally with a viscous and resinous coating, and furnished internally with a downy tissue, destined to defend the inclosed organs from the rigour of winter. No envelopes of this kind are observed on the buds of the greater number of tropical plants. Buds on exogenous plants are in their commencement cellular prolongations from the medullary rays, which force their way through the bark. The cellular portion is surrounded by spiral vessels, and covered with rudimentary leaves. When the vascular part of the bud develops the central cellular portion remains as pith, inclosed in a medullary sheath, which isolates it from the parent stem. Thus it remains till the second year. The bud here described, which contains the rudiments of future leaves, branches, &c., is called a leaf-bud. Sometimes more than one bud

is found in or near the axil of a single leaf, in which case all but the proper axillary bud are called *accessory* buds. The buds begin to show themselves as soon as the leaves have taken their full development. They are then very small, as the developed leaves absorb the nutritive juices of the plant, leaving them little nourishment. On the fall of the leaf they enlarge, and take the form they are to retain during winter, in which season they are stationary. On the return of spring they begin to swell, and burst the scales which form their external covering, and the young shoots which these have served to protect now make their appearance. The external scales of the bud are usually deciduous, that is, fall off when the young shoot appears; sometimes, however, they are persistent. These scales sometimes represent leaf-blades, as in lilac; sometimes stipules, as in the beech; or petioles, as in the horse-chestnut. Flower-buds are produced in the axil of leaves called *bract* leaves or *bracts*. They are not capable of extension by the development of the central cellular portion, and instead of the conservative organs of plants, leaves and branches, they produce the reproductive organs, flowers and fruit. Perennial herbaceous plants spring from a subterranean bud called the *tubercle*, which is developed annually, and from which the new stem is produced. The bulb is a species of bud of this kind. The arrangement of the leaves in a leaf-bud is called its *vernation*; of the petals and sepals in a flower-bud, its *anthesis*.

BUDAPEST, the official name of the united towns of Buda or Ofen and Pest (or Pesti), the one on the right, the other on the left, of the Danube, forming the capital of Hungary, the seat of the Hungarian parliament and supreme courts. Buda, which is the smaller of the two, and lies on the west bank of the river (here flowing south), consists of the fortified Upper Town on a hill, the Lower Town (or Water Town) at the foot of the hill, and several other quarters, including Old Buda further up the river. Among the chief buildings are the royal castle and several palaces, the arsenal, town-hall, government offices, &c., the church of St. Matthew, dating from the thirteenth century, during the Turkish occupation a mosque for 150 years, and recently rebuilt; and the finest Jewish synagogue in the empire. Pest, or the portion of Budapest on the left or east bank of the river, consists of the inner town of Old Pest on the Danube, and a semicircle of districts—Leopoldstadt, Theresienstadt, Elizabethstadt, &c.—which have grown up around it. The river is at this point somewhat wider than the Thames at London, and the broad quays of Pest extend along it for from two to three miles. It is spanned by fine suspension and other bridges. Pest retains, on the whole, fewer signs of antiquity than many less venerable towns. Its fine frontage on the Danube is modern, and includes the new houses of parliament, the academy of science, exchange, custom-house, and other important buildings. The oldest church dates from 1600; the largest building is a huge pile used as barracks and arsenal. Other buildings include the old and the new town-house, national museum, national theatre, university buildings, various palaces, the opera-house, &c. Budapest contains the most important of the three universities of Hungary, attended by about 4500 students and having over 220 professors, lecturers, &c. Another important educational institution is the technical high schools, with 60 teachers and 1100 to 1200 students, and a library of 60,000 volumes. In commerce and industry Budapest ranks next to Vienna in the empire. Its chief manufactures are machinery, gold, silver, copper, and iron wares, chemicals, textile goods, leather, tobacco, &c. A large trade is done in grain, wine, wool, cattle, &c.

Budapest is strongly Magyar in character and sentiment, and as a factor in the national life may almost be regarded as equivalent to the rest of Hungary. Old Buda was founded by the Romans about 150 A.D. Pest is of much later origin. From 1541 to 1686 Buda was the seat of a Turkish pasha, the Turks being then driven out. The towns were united as one municipality in 1873. It was not until 1799 that the population of Pest began to outdistance that of Buda; but from that date its growth was very rapid and out of all proportion to the increase of Buda. In 1799 the joint population of the two towns was little more than 50,000; in 1890 it was 506,384; in 1900, 738,322.

BUDDHA, or **THE BUDDHA** (that is, 'the enlightened'), the sacred name of the founder of Buddhism, who would appear (according to the judgment of those scholars who have given most attention to this point) to have lived in the fifth century B.C. His personal name was Siddhartha, and his family name Gautama; and he is often called also Sakya-muni (from *Sakya*, the name of his tribe, and *muni*, a Sanskrit word meaning solitary). His father was King of Kapilavastu, a few days' journey north of Benares. Siddhartha was early filled with a deep compassion for the degeneracy and misery of the human race, and a deep feeling of the vanity of earthly things. His melancholy thoughts would not be stifled in the enjoyments of his father's court; he must find peace for his own soul, and bestow it upon others. To this end he left his father's court, and after having attended the schools of the Brahmans without profit, and lived for years a life of solitude and asceticism, he at last, by dint of profound meditation, acquired clear notions on the life of man and his relations to the universe, and found out the true path which was to lead his fellow-creatures to the goal of life. It was then that he became the Buddha, and began to teach his new faith in opposition to the prevailing Brahmanism. The first place at which he taught, or, in the mystic phrase of Buddhism, 'turned the wheel of the law', was Benares. He soon made many converts, especially among the lowly and oppressed, for his teaching was addressed to all alike, without distinction of person or caste. Many of the Brahmans also joined him, wearied with the severe and oppressive observances of their own religion, which contrasted so unfavourably with the simplicity of the new faith. Among his earliest converts were the monarchs of Magadha and Kosala, in whose kingdoms he chiefly passed the latter portion of his life, respected, honoured, and protected.

The theory of the 'four sublime verities' lies at the foundation of the doctrines of the Buddhists. The first verity is that pain is inseparable from existence, inasmuch as existence brings old age, sickness, and death; the second, that pain is the offspring of desire, and of faults which desire has made us commit in previous states of existence (for Sakya-muni adopted fully the prevailing doctrine of Brahmanism with regard to the transmigration of souls) or in the present; the third verity tells us that existence, and therefore pain, can only cease through Nirvana; the fourth, that in order to attain Nirvana our desires and passions must be suppressed, every obstacle to the extinction of desire must be set aside, the most extreme self-renunciation must be practised, and we must, in short, forget our own personality so far as possible. The last verity is the most important in its practical application, as pointing out the way to salvation and providing a rule of conduct. The way to salvation consists of eight parts or conditions that a man must fulfil. The first is in Buddhist language *right view*; the second is *right judgment*; the third is *right language*; the fourth is *right purpose*; the fifth is *right profession*; the sixth

is *right application*; the seventh is *right memory*; the eighth is *right meditation*. The five fundamental precepts of the Buddhist moral code are—not to kill, not to steal, not to commit adultery, not to lie, and not to give way to drunkenness. To these there are added five others of less importance, and binding more particularly on the religious class, such as to abstain from repasts taken out of season, from theatrical representations, &c. There are six fundamental virtues to be practised by all men alike, viz. charity, purity, patience, courage, contemplation, and knowledge. These are the virtues that are said to 'conduct a man to the other shore.' The devotees who strictly practise them has not yet attained Nirvana, but is on the road to it. The Buddhist virtue of charity is universal in its application, extending to all creatures, and demanding sometimes the greatest self-denial and sacrifice. There is a legend that the Buddha in one of his stages of existence (for he had passed through innumerable transmigrations before becoming 'the enlightened') gave himself up to be devoured by a famishing lioness which was unable to suckle her young ones. There are other virtues, less important, indeed, than the six cardinal ones, but still binding on believers. Thus not only is lying forbidden, but evil-speaking, coarseness of language, and even vain and frivolous talk, must be avoided. Buddhist metaphysics are comprised in three theories—the theory of transmigration (borrowed from Brahmanism), the theory of the mutual connection of causes, and the theory of Nirvana. The first requires no explanation. According to the second, life is the result of twelve conditions, which are by turns causes and effects. Thus there would be no death were it not for birth; it is therefore the effect of which birth is the cause. Again, there would be no birth were there not a continuation of existence. Existence has for its cause our attachment to things, which again has its origin in desire; and so on through sensation, contact, the organs of sensation and the heart, name and form, ideas, &c., up to ignorance. This ignorance, however, is not ordinary ignorance, but the fundamental error which causes us to attribute permanence and reality to things. This, then, is the primary origin of existence and all its attendant evils. Nirvana is eternal salvation from the evils of existence, and the end which every Buddhist is supposed to seek. It is not so easy to determine exactly what this Nirvana means, however; but the best authorities (Burnouf, Tournouf, Spence Hardy, Barthélemy Saint-Hilaire, &c.) affirm that it means the complete annihilation of the thinking principle. Sakya-muni did not leave his doctrines in writing; he declared them orally, and they were carefully treasured up by his disciples, and written down after his death. The determination of the canon of the Buddhist scriptures as we now possess them was the work of three successive councils, and was finished two centuries at least before Christ. The religion soon spread through Hindustan, though it was afterwards (probably through persecution) entirely banished from it. Many rock-temples, inscriptions, &c., testify to its former prevalence in this region. From Hindustan it spread in all directions—to Ceylon, Java, Cochin-China, Laos, Burmah, Pegu, Nepal, Tibet, Mongolia, Tartary, China (where Buddha is called Fo), and Japan, in which countries it still prevails. At present it is professed by perhaps a third of the human race.

BUDDING, in gardening, is the art of multiplying plants by causing the leaf-bud of one species (or, more commonly, variety) to grow upon the branch of another. The operation consists in shaving off a leaf-bud, with a portion of the wood beneath it, which portion is afterwards removed by a sudden jerk of the operator's finger and thumb, aided by the

budding-knife. An incision in the bark of the stock is then made in the form of a T; the two side lips are pushed aside, the bud is thrust between the bark and the wood, the upper end of its bark is cut to a level with the cross arm of the T, and the whole is bound up with netting or worsted, the point of the bud alone being left exposed. In performing the operation, a knife with a thin flat handle, and a blade with a peculiar edge is required. The following conditions are essential to the success of the operation:—First, the bud must be 'ripe,' that is, fully formed—which is known by its plumpness and hardness. If too young, it will not succeed, because it has not acquired vitality enough to depend upon its own resources, until that new growth has taken place which attaches it to the stock. If too old, 'sprung,' or beginning to grow, it is also unfit for use, because the new organs belonging to the young growth need an instant and uninterrupted supply of food, which in the beginning the bud cannot obtain from the branch. Secondly, the bark of the stock must 'run freely,' that is, must separate readily from the wood below it. This separation is necessary in order that the bud may be inserted beneath the bark; and is always attended by the presence of a large quantity of the viscid matter called *cambium*, which is in fact a mixture of young tissue in the act of organizing and of organisable matter. The bud coming in contact with this substance, young and full of vitality, readily forms an adhesion with it, and thus the operation is complete. On this account young branches should always be chosen, since the bark never runs so freely, that is, there is never so great a collection of cambium under it in old branches. Those of the year in which the operation is performed are the best, provided they are advanced towards maturity. Shoots far advanced in a second year's growth are, however, often used, and with success. With regard to the time of performing the operation, autumn is preferred in this country, but it may be practised also in spring. Buds take better in autumn, because the stock has at that period ceased growing, and is chiefly occupied in storing up the organisable material required for the nutrition of the young organs, of which the bud, by the act of insertion, has become one. It ought to be borne in mind that the nearer the constitution of the stock approaches that of the bud, the greater is the success that attends this operation. If they are in any considerable degree dissimilar, the operation becomes precarious; if very different, it is impracticable.

BUDE, GUILLAUME, more generally known under the Latin form *Budeus*, one of the greatest French scholars of his time, was born at Paris in 1467, and died in 1540. He was royal librarian and master of *requêtes*. From his twenty-fourth year he devoted himself to study with the greatest zeal, in particular to belles-lettres, to mathematics, and to Greek. Among his philosophical, philological, and juridical works, his treatise *De Asse et Partibus ejus*, and his commentaries on the Greek language, are of the greatest importance. By his influence the Collège Royal de France was founded. He enjoyed, not only as a scholar, but also as a man and citizen, the greatest esteem. His works appeared at Bale, 1557, four vols. folio.

BUDE LIGHT, an exceedingly brilliant light, produced by directing a current of oxygen gas into the interior of the flame of an argand-lamp or gas-burner, by which intense combustion is established and a dazzling light obtained. This plan of lighting was adopted in the House of Commons in 1840 and continued till 1852, when another system of lighting was introduced. It was invented by Mr. Gurney, of Bude, in Cornwall, and hence the name.

BUDGELL, EUSTACE, a miscellaneous writer, was born at St. Thomas, near Exeter, 19th August, 1886, and educated at Trinity College, Oxford; after which he went to London, and was entered of the Inner Temple, where his inclinations led him to neglect his profession, and study polite literature. He was a relative of Addison, who in 1717, when principal secretary of state in England, procured for Budgell the place of accountant and comptroller-general of the revenue in Ireland. He lost these places when the Duke of Bolton was appointed lord-lieutenant, in 1718, apparently through some dispute. He then returned to England, where, in 1720, he lost £20,000 by the South Sea bubble. He afterwards tried to get into Parliament, and spent £5000 more in unsuccessful attempts, which completed his ruin. In 1727 the Duchess-dowager of Marlborough gave him £1000 for the purpose of getting him into Parliament; but his attempts were ineffectual. In 1733 he commenced a weekly paper, called the *Bee*, which was very popular. On the death of Dr. Tindal, the author of *Christianity as Old as the Creation*, a will was produced by which £2000 was left to Budgell. This sum was so disproportionate to the testator's circumstances (his whole estate did not amount to so much), and the legacy so contrary to his known intentions, that suspicions arose respecting the authenticity of the testament; and Budgell's reputation was completely blasted. Ruined in fortune and character, he ended his life by drowning himself in the Thames, May 4, 1736. He wrote papers in the *Spectator* signed X.; also others in the *Guardian*, &c.

BUDGET, in the parliamentary language of Britain, means a statement of the revenue and expenditure for the ensuing year proposed by government, and comprehends a general view of the national debt, the chief items of income and expenditure, ways and means of raising supplies, &c., with the actual result of the preceding budget. It is brought forward in the House of Commons by the chancellor of the exchequer. The term has been adopted by various other countries.

BUDIŠSIN. See **BAUTZEN**.

BUDWEIS, a city of Bohemia, 75 miles s. of Prague. It is well built, and has a cathedral and episcopal palace, a handsome townhouse, a theological school, and a fine market-place lined with arcades. It has a flourishing trade, and manufactures of earthenware, cloth, machinery, &c. Pop. on the 31st of Dec. 1900, 39,630.

BUENAVENTURA, a seaport of Colombia, on the Bay of Choco, on a small island at the mouth of the Dagua, 200 miles s.w. of Santa Fé de Bogota. It is the port of Santa Fé de Bogota, Popayan, and Cali.

BUEN AYRE, or **BONAIR**, a small island off the coast of Venezuela, belonging to the Dutch, 50 miles in circumference, inhabited chiefly by Indians, with a small mixture of Europeans; mountainous, producing a few cattle, goats, large quantities of poultry, and a considerable quantity of salt. It has springs of fresh water. On the s.w. side is a good harbour and road. Pop. 4000.

BUENOS AYRES, one of the provinces of the Argentine Republic, lying w. of the La Plata and Atlantic Ocean, and separated from Patagonia by the Rio Negro. The province presents nearly throughout level or slightly undulating plains, known as the *pampas* of Buenos Ayres. They are covered with tall waving grass, which affords pasture to vast numbers of sheep, cattle, and horses. These constitute the chief wealth of the inhabitants; and their products, along with wheat, are the chief exports. The climate is generally healthy. Pop., according to census of 1895, 921,163.

BUENOS AYRES (or **AIRES**), or **NUESTRA SEN-**

ORA DE BUENOS AYRES, a city of South America, in the above province, capital of the Argentine Republic, on the south-west side of the La Plata, 150 miles from its mouth. Lon. 68° 23' w.; lat. 34° 36' s. The situation is agreeable and healthy, and the city derives its name from the salubrity of its climate. The temperature is nearly the same throughout the year. Until 1867 epidemic diseases were unknown in Buenos Ayres, but in that year cholera was introduced into the town from the scene of war in Paraguay, and many fell victims to it; and in 1871 yellow fever followed and caused a still more wide-spread mortality. These visitations showed the inhabitants the necessity of paying more attention to sanitary matters than they had hitherto done. The drainage of the city was at that time very bad, and there was a great deficiency of water; but great works for remedying both these defects have been carried out with the most beneficial results. The water is obtained from the river and is filtered before distribution. The city is built with great regularity, the streets uniformly crossing each other at right angles, but the great bulk of the houses are only of one storey. Buenos Ayres contains the palace of the president, the house of congress, a town-hall, a cathedral, arch bishop's palace, various Catholic and four Protestant churches, a university, several theatres, opera-house, mint, exchange, general post office, handsome banks, custom-house, lunatic asylum, founding hospital, and other charitable institutions. The university, founded in 1824, is attended by about 700 students, and possesses a library and an excellent museum. There are also in Buenos Ayres secondary schools or colleges, two normal schools, and numerous other schools, besides literary and scientific societies. Another institution worthy of mention is the asylum for immigrants, in which persons are received and maintained until suitable employment is found for them. Till recently there was no harbour at Buenos Ayres, and owing to the shallowness of the water large vessels could only come within 8 or 9 miles of the town, where they unloaded their goods into boats; but all this has been altered by the excavation of channels of approach and the construction of a series of docks and basins at the city itself, already costing (though the scheme is not yet fully carried out) about £4,600,000. A sub-port is that of La Plata, a new town 30 miles lower down the estuary, and now the capital of the province. There are 180 miles of tramways in the town. The environs are well cultivated, furnishing in abundance the chief necessities of life. The wealthier inhabitants have country houses in the neighbourhood. Wood is very dear, since timber for building houses, and constructing and refitting the vessels that navigate the river, mostly comes from Paraguay in rafts. Buenos Ayres has risen to the position of one of the leading commercial centres of South America, its exports and imports together annually amounting to over £25,000,000. It imports cotton, linen, woollen, and silk manufactured goods, iron and iron goods, machinery, jewelry, earthenware, glass, leather, hats, wines, &c.; and exports wool, meat, cattle, hides, skins, wheat, maize, &c. The wool exports especially are becoming every year more considerable. The chief countries with which it carries on trade are England, France, Spain, the United States, Belgium, Brazil, and Italy; and the foreign trade is almost entirely in the hands of Europeans, principally Englishmen, but also Frenchmen and Germans. About one-fourth of the inhabitants are whites; the rest are Indians, negroes, and of mixed blood. Pop. (1898), including suburbs, 751,685.

Buenos Ayres was founded in 1535 by Don Pedro de Mendoza, but being destroyed by the Indians it

was colonised a second time in 1580. In 1776 it became capital of the viceroyalty of La Plata, and it has always played a chief part in the history of the La Plata states. In 1806 Buenos Ayres was conquered by an English squadron under the command of Admiral Popham and General Beresford. Soon after, the inhabitants, having recovered from their terror, attacked the British by surprise and made a great slaughter among them. In the following year an unsuccessful attempt was made by the British to recapture the city. Encouraged by this success the colonists soon afterwards severed their connection with Spain. In 1890 the government being overthrown, the city was the scene of rioting and bloodshed.

BUFFALO, a city of the United States, New York, capital of the county of Erie, at the N. extremity of Lake Erie, where the Niagara issues from it, and on the New York Central, and various other lines of railway; lat. 42° 53' N.; long. 78° 55' W. It consists principally of wide and straight streets, which cross at right angles, but partly also of others, which meet the main street obliquely and prevent monotony of aspect. Many of the streets are adorned with trees and shrubs. The whole site is a plain, with a gentle descent towards the lake, and is well covered with houses, except in a few localities, where open spaces or squares have been left for ornament and ventilation. The climate is said to be more equable than that of any other place of the same latitude within the States, and this, combined with an admirable system of sewerage, has proved so conducive to health that the yearly rate of mortality is exceedingly low. The large waterworks belong to the city, but the gas and electric lighting are controlled by companies. The principal public buildings are the city and county hall, with court-house, built of granite and completed in 1876; the post-office and custom-house; four excellent market-houses, and numerous churches, among which particular notice is due to the Episcopal churches of St. John and St. Paul—the former built in a kind of transition style from the early English to the Gothic, the latter remarkable for its picturesque appearance and the variety of its outlines—and to the Roman Catholic cathedral, an imposing structure in the decorated Gothic, flanked on its N. front with two towers, and adorned with a window of stained glass from Munich. The International Bridge, a fine trussed iron structure across the Niagara, was completed in 1873. The other buildings and institutions of note are a state normal school and school of practice, occupying a fine building, a liberally endowed and flourishing female academy, a young men's literary association with a library of about 50,000 volumes; two orphan asylums; five hospitals; a fine music-hall; a state asylum for the insane; a splendid exchange; a state armoury and arsenal; and many fine cemeteries. The industries are numerous and very important, comprising iron, machinery, ship-building, leather, beer, flour, &c. The trade, greatly favoured by the harbour at the mouth of the Buffalo river in Lake Erie—which by means of breakwaters has been rendered safe and capacious,—and by the various railways, is largely developed. The chief articles are flour, grain, lumber, and live stock. The prosperity of Buffalo dates from the completion of the Erie Canal, which has its western extremity here, and which connects the lake with the river Hudson. Buffalo was founded at the beginning of the nineteenth century, and was burned by the British in 1813. At the 'Pan-American' exhibition held here in 1901, President McKinley was assassinated. Pop. (1890), 255,664; (1900), 352,219.

BUFFALO, the name given to those species of ox which have a thick-set body, a large thick head,

large pendent ears, fairly long tails with a tuft at the end, short necks, broad muzzles, and immense and widely extended horns, which are generally compressed at the sides and turned first downwards and then upwards, and which are sometimes also marked by irregular rings, or covered with protuberances. They are remarkable for their wildness, their strength, and their cunning. The Cape buffalo (*Bos Caffer*) is the most remarkable of these animals. It is very large, strong, and wild, and it is especially distinguished by its horns, which become very thick at the roots, where they appear like two immense swellings, which almost meet above the middle of the skull. In colour it is very dark, almost black, sometimes however inclining to brown. It takes its name from the Cape of Good Hope, but except in the Knyana and Tizizikama forests and the Addo Bush near Port Elizabeth, it is extinct south of the Limpopo. In the forests lying to the S. of Kordofan they often appear in great numbers. They are extremely savage in disposition, and on that account are more feared by the tribes dwelling near their haunts than even the lion or the elephant. A Cape buffalo will sometimes hide himself behind trees watching till either man or beast approaches, then will suddenly dart out and attack his victim; and he is not content when he has killed him, but will crush him under his hoofs and tear him with his horns, and will even return after he has once left him, and attack him with renewed fury. At the same time he is so swift that unless a person is well mounted there is no chance of escaping him, and even then one is in great danger unless some elevated position can be reached, where the pursuer cannot follow so fast. These animals are generally found in herds, sometimes greater and sometimes smaller. Livingstone mentions herds of sixty, and Selous states that the herds consist of from fifty to two or three hundred. The animals are often accompanied by a bird, which both frees them from vermin and warns them of the approach of danger by flying up into the air. In the south of Africa the bird which attaches itself to the buffalo in this way is the *Texlor erythrorhynchos*; in the north it is a small kind of heron of a pure white colour called *Ardeola bubulcus*. In spite of the savageness of this species of buffalo when in a wild state, it is capable of being tamed, and when well treated exhibits a great deal of good nature. It prefers marshy ground, and is seldom found far from water. Rinderpest has much reduced the numbers of this species in recent years. Another African species is the short-horned buffalo (*Bos pumilus*), a smaller animal than the Cape buffalo, and having smaller horns and more abundant hair of a lighter colour. The natives of West Africa, where this species is found, call it the *niari*, and the Europeans know it as the *bush-cow*. Several varieties of it are known, and some naturalists regard it as simply a much modified form of the larger species already described.

In India also there are still several varieties of the wild buffalo, from one of which the common or domestic buffalo frequently seen in Italy, Hungary, &c., is supposed to be derived. Of the Indian buffaloes the best-known is the arnes (*Bos bubalus*). It is some 5 feet high at the shoulders, and from 9 to 10½ feet long from the muzzle to the root of the tail. Its colour is like the former, a very dark brown, almost black. This species also is very savage when in a wild state, but capable of being tamed, when it becomes sufficiently docile. In India and the Eastern Peninsula animals of this species are used both for riding and for agricultural purposes. The common buffalo, by many considered a variety of the arnes, is also a native of India. Its horns are large, thick at

the roots, but gradually become thinner. The sides are compressed, only a third part at the end being rounded; from the roots to about the middle they are furrowed on the surface in front, but behind and at the ends they are almost quite smooth. The hair of the common buffalo is thin, stiff and bristly, and elongated at the shoulders and the neck in front, as well as on the forehead and at the extremity of the tail. The crupper, the breast, the under part of the body, and the greater part of the legs are quite naked. Its senses of smell and hearing are remarkably acute, but its sight is not so good. It is a formidable enemy of the tiger, and in contests with this animal is almost always victorious. It is one of the favourite spectacles of the Indian princes to witness a fight between two of these animals which have been brought together for the purpose. Hot, marshy districts are best adapted to the constitution of the buffalo. The Delta of the Nile is a paradise for him, and in the pestilential air of the Pontine Marshes, as well as in the marshy districts of Calabria and Apulia, in the Maremma of Tuscan, and the countries of the lower Danube, he is quite at home. In Italy he is almost the only domestic animal. In Lower Egypt he is common everywhere as a domestic animal, and the cow yields excellent milk and butter. See plate at UNGULATA. The animal called buffalo in America is properly the bison (which see).

BUFFET, anciently a little apartment, separated from the rest of the room, for the disposing of china, glass, &c. It is now a piece of furniture in the dining-room, called also a sideboard, for the reception of the plate, glass, &c. In France many mansions have a detached room called *buffet*, decorated with pitchers, vases, fountains, &c. The word is now very commonly applied to the space set apart for refreshments in public places.

BUFFIER, CLAUDE, a writer of considerable eminence, born in Poland of French parents in 1661, was brought up at Rouen, became a Jesuit, and for some time occupied a chair of theology, and died at Paris in 1737. Among his works, which are generally characterized by elegance of style, and deep, original thought, is a *Traité des Premières Vérités*, which proves him to have been an able metaphysician, and is much praised by Dugald Stewart.

BUFF LEATHER, a kind of leather which is prepared by saturating the hides with some aluminous substance, and afterwards with oil. Leather prepared in this way is softer and more flexible than any other kind of leather, and on that account it is much used for soldiers' cross-belts, gloves, and other military accoutrements. Its colour is naturally light yellow, but it is in some cases bleached before being used. The buff leather which was used in former times to make the jerkins which were worn under coats of mail to deaden the pressure of the metal on the body, and to prevent any contusion from a blow, was made from the hide of the urus, or wild bull of Central Europe, the common name of which was *buffe*, from which the name of the leather was derived.

BUFFON, GEORGE LOUIS LECLERC, COUNT DE, one of the most celebrated naturalists and authors of the eighteenth century, was born at Montbard, in Burgundy, 1707, and received from his father, Benjamin Leclerc, councillor to the parliament of his province, a careful education. Chance connected him at Dijon with the young Duke of Kingston, whose tutor, a man of learning, inspired him with a taste for the sciences. They travelled together through France and Italy, and Buffon afterwards visited England. In order to perfect himself in the language without neglecting the sciences, he translated Newton's *Fluxions*, and Hales' *Vegetable Statics*. After

some time he published some works of his own, in which he treated of geometry, natural philosophy, and rural economy. He laid his researches on these subjects before the Academy of Sciences, of which he became a member in 1733. The most important were on the construction of mirrors for setting bodies on fire at a great distance, as Archimedes is said to have done, and experiments on the strength of different kinds of wood, and the means of increasing it, particularly by removing the bark of the trees some time before felling them. Buffon, in his earlier years, was animated only by an undefined love of learning and fame, but his appointment as superintendent of the Royal Garden (now the Jardin des Plantes), in 1739, gave his mind a decided turn towards that science in which he has immortalized himself. Considering natural history in its whole extent, he found no works in this department but spiritless compilations and dry lists of names. There were excellent observations indeed on single objects, but no comprehensive work. Of such a one he now formed the plan, aiming to unite the eloquence of Pliny, and the profound views of Aristotle, with the exactness and the details of modern observations. To aid him in this work, by examining the numerous and often minute objects embraced in his plan, for which he had not the patience nor the physical organs requisite, he associated himself with Daubenton, who possessed the qualities in which he was deficient; and after an assiduous labour of ten years, the two friends published the three first volumes of the *Natural History*, and, between 1749 and 1767, twelve others, which comprehend the theory of the earth, the nature of animals, and the history of man and the viviparous quadrupeds. The most brilliant parts of them, the general theories, the descriptions of the characters of animals, and of the great natural phenomena, are by Buffon. Daubenton limited himself to the description of the forms and the anatomy of the animals. The nine following volumes, which appeared from 1770 to 1783, contain the history of birds, from which Daubenton withdrew his assistance. The whole shape of the work was thus altered. Descriptions, less detailed, and almost entirely without anatomy, were inserted among the historical articles, which at first were composed by Guéneau de Moutbeillard, and afterwards by the Abbé Bexon. Buffon published alone the five volumes on minerals, from 1783 to 1788. Of the seven supplementary volumes, of which the last did not appear until after his death in 1789, the fifth formed an independent whole, the most celebrated of all his works. It contains his *Epochs of Nature*, in which the author, in a style truly sublime, and with the triumphant power of genius, gives a second theory of the earth, very different from that which he had traced in the first volumes, though he assumes at the commencement the air of merely defending and developing the former. This great labour, with which Buffon was occupied during fifty years, is, however, but a part of the vast plan which he had sketched, and which has been continued by Lacépède in his history of the different species of cetaceous animals, reptiles, and fishes, but has remained unexecuted as far as regards the invertebrate animals and the plants. There is but one opinion of Buffon as an author. For the elevation of his view, for powerful and profound ideas, for the majesty of his images, for noble and dignified expression, for the lofty harmony of his style in treating of important subjects, he is perhaps unrivalled. His pictures of the sublime scenes of nature are strikingly true, and are stamped with originality. The fame of his work was soon universal. It excited a general taste for natural history, and gained for this science the favour and protection of nobles and princes. Louis XV

raised the author to the dignity of a count, and D'Argvilliers, in the reign of Louis XVI., caused his statue to be erected, during his life, at the entry of the Royal Cabinet of Natural Curiosities, with the inscription 'Majestati nature par ingenium.' The opinions entertained of Buffon as a natural philosopher and an observer have been more divided. Voltaire, D'Alembert, Condorcet, have severely criticized his hypotheses and his vague manner of philosophizing from general views. But although the views of Buffon on the theory of the earth can no longer be defended in detail, he will always have the merit of having made it generally felt, that the present state of the earth is the result of a series of changes which it is possible to trace, and of having pointed out the phenomena which indicate the course of these changes. His theory of generation has been refuted by Haller and Spallanzani, and his hypothesis of a certain inexplicable mechanism to account for animal instinct is not supported by facts; but his eloquent description of the physical and moral development of man, as well as his ideas on the influence which the delicacy and development of each organ exert on the character of different species of animals, are still of the highest interest. His views of the degeneracy of animals, and of the limits prescribed to each species by climates, mountains, and seas, are real discoveries which receive daily confirmation, and furnish to travellers a basis for their observations, which was entirely wanting before. The most perfect part of his work is the History of Quadrupeds; the weakest, the History of Minerals, in which his imperfect acquaintance with chemistry and his inclination to hypothesis have led him into many errors. His last days were disturbed by the painful disease of the stone, which did not, however, prevent the prosecution of his great plan. He died at Paris, April 16, 1788, at the age of eighty-one years, leaving an only son, who perished in the revolution by the guillotine. Buffon was of a noble figure, and of great dignity of manners. His conversation was remarkable for a simplicity which strikingly contrasted with the style of his writings. The best edition of his Natural History is that published from 1749 to 1789, in thirty-six vols.

BUFFONE (Italian), buffoon; a comic singer in the opera buffa, or the Italian *intermezzo*. The Italians, however, distinguish the *buffo cantante*, which requires good singing, from the *buffo comico*, in which there is more acting. *Buffoonery* is the name given to the jokes which the buffoon introduces. The word is no doubt borrowed from the Low Latin, in which the name *buffo* (cheeked) was given to those who appeared on the theatre, with their cheeks puffed up, to receive blows on them, and to excite the laughter of the spectators. Afterwards the name came to signify a mimic, a jester in general.

BUG, or **Boo**, a river in European Russia which rises near the confines of Volhynia, in the n.w. of gov. Podolsk, and proceeds first s. and then s.e. through that gov. to Oliwopol, where it enters gov. Kherson, which it traverses almost centrally from n. to s., and falls into the estuary of the Dnieper, near Kherson. Its chief affluents are the Ingul, Balta, Ichertal, and Solonchoka. The chief towns on its banks, besides those mentioned, are Bratslav, Voznesensk, and Nikolaev. It has a course of above 400 miles, but its navigation is greatly obstructed by rocks and sandbanks. There is another Bug in Russian Poland, a tributary of the Vistula, into which it falls about 20 miles n.w. of Warsaw. It is navigable for nearly 300 miles.

BUG (*Cimex Lectularius*), a well-known and most annoying insect, of a flat shape and rust colour, furnished with two horns, six legs, and a long sharp

proboscis. The female lays from 12 to 14 eggs, which hatch in from 5 to 12 days. The young, at first transparent and white, change to red on being filled with blood. The best remedy is to wash infested furniture with a solution of corrosive sublimate, or spirits of turpentine. (See plate at ENTOMOLOGY.)

BUGEAUD DE LA PICONNERIE, THOMAS ROBERT, DUKE D'ISLY, a marshal of France, born at Limoges in 1784, belonged to an Irish family which had settled in France with James II. on his expulsion from the British throne. He entered the army in 1804 as a simple grenadier, was corporal at Austerlitz, where he gave proofs of courage, and the year after was sub-lieutenant. He made the campaigns of Prussia and Poland with his new regiment, and was wounded at Pultusk in 1806. He afterwards went into Spain as lieutenant adjutant-major, gained new promotion, and remained with the army of Aragon till 1814. During these long wars he repeatedly distinguished himself, and received honourable mention from Suchet, his commander-in-chief. On the restoration of the Bourbons he gave in his adhesion to them; but on the landing of Bonaparte, followed the general example by deserting to his old master. After the revolution of 1830 he was appointed *maréchal de camp*, and in 1831 obtained a seat in the Chamber of Deputies, where he often displayed great good sense, though in a style of oratory so blunt and rustic as occasionally to excite the risibility of his opponents. He was afterwards sent to Algeria, where he gained many advantages over the Arabs, and showed himself possessed of the kind of talents necessary to cope successfully with them and their celebrated leader, Abd-el-Kader. On the revolution of 1848, it is said that, if permitted, he would have effectually put down the insurgents and secured the throne to Louis Philippe. He afterwards gave in his adhesion to the republic, but remained unemployed. He was better received by President Louis Napoleon, who appointed him commander-in-chief of the army of the Alps. He died of cholera in 1849.

BUGENHAGEN, JOHN, also POMERANCE, DOCTOR POMMER, was of great service to Luther in the Reformation. He was born in 1485 at Stettin, and in 1506 was made rector of the school in Treptow. He fled from his Catholic superiors to Wittenberg in 1521, where he was made, in 1522, professor of theology. Luther derived assistance from his profound exegetical learning, in preparing his translation of the Bible. In 1525 he gave occasion for the controversies about the sacrament, by a work against Zwinglius on the communion. He acquired more reputation by his excellent *Interpretatio in Librum Psalmorum* (Nürnberg, 1523). He effected the union of the Protestant free cities with the Saxons, and introduced into Brunswick, Hamburg, Lübeck, Pomerania, Denmark, and many other places, the Lutheran service and church discipline. For the Lower Saxons he translated the Bible into Low German (Lübeck, 1533). He was a faithful friend to Luther, and delivered his eulogy. Together with Melancthon, he composed the Interim of Leipzig. He wrote also a History of Pomerania. He died in 1558.

BUGIS, a people, Indian Archipelago, chiefly inhabiting Macassar and Boni, in the island of Celebes. They are muscular, middle-sized, and of a light-brown colour, some being even fair. Their dress consists of a piece of red or blue striped cotton, which they wrap about their loins, and pass between their legs. They bind their jet-black hair very tastefully, in a red or blue cotton handkerchief. They pluck out the hair of their beards, and ornament their arms and legs with brass wire above the wrists and ankles, and to these the children attach bells. They are, to

a notable degree, proud, passionate, revengeful, and crafty; yet they are regarded as the most civilised of the natives of Celebes, and are the chief trading people in the Malay Archipelago. Their fondness for commerce has led to their settling in many places out of Celebes, and a 'Bugle quarter' is to be found in most of the large towns of the different islands. They build ships of 50 or 60 tons burden, and their voyages extend from Sumatra to New Guinea. From Macassar the voyage begins with the east monsoon, the prahu trading as they proceed w., until they reach Rhio, and even Malacca and Acheen, when they are prepared to return with the change of the season. They take with them native cotton cloths, gold-dust, nutmegs, silver dollars, birds'-nests, camphor, benzoin or frankincense, and tortoise-shell; and return with European broadcloths and cottons, opium, unwrought iron, and tobacco, which they partly sell at the intermediate ports as they sail homewards. This is their most important voyage, but they make many subordinate ones for collecting birds'-nests, feathers, tortoise-shell, trepang, and other articles of commerce.

BUGLE-HORN. See **HORN.**

BUGLOSS, a popular name applied to a number of plants of the natural order Boraginæ, and in particular to a plant akin to alkanet (which see), namely, *Anchusa* (or *Lycopsis*) *arvensis*, a common British weed with pale-blue flowers, growing to the height of 6 inches or a foot, and plentiful in corn-fields and waste grounds.

BUHL-WORK, a description of inlaid work, said to have been invented by Boule, a French cabinet-maker, in the reign of Louis IV. It consisted at first of inserting a brass scroll or pattern in a ground of dark-coloured tortoise-shell or wood; but at a later period the use of wood of a different colour, instead of metal, was introduced by Reissner, and to his process the modern practice of buhl-work is chiefly confined. It consists in cutting out a pattern from two veneers of different coloured woods, which are glued together with a piece of paper laid between them; the pieces are then separated by running a thin knife through the paper, the patterns are carefully taken out, and the figure removed from the one veneer is inserted into the cavity of the other, the dust of the wood being rubbed in to fill the interstices. A little glue is then rubbed in, and the work laid aside to dry, after which it is ready to be glued to the box or piece of furniture which it is wished to ornament. The cutting of the pattern is effected by the use of a very fine saw, of the kind known as a key-saw, which can readily be made to run around the sinuities of the patterns. The suitable designs for this work are continuous figures like a running vine, or the honey-suckle, the saw completing these without the necessity of discontinuing the work to commence anew. Two pieces of buhl work are thus produced; but three are frequently obtained by gluing together three pieces of wood, and cutting out in the same manner. It is not, however, found expedient to combine a greater number of pieces. The French term for buhl-work and all sorts of inlaid work, is *marqueterie*. See **MARQUETRY**.

BUILDING SOCIETIES were originally societies formed for the purpose of providing the poorer classes with suitable dwellings, either as tenants or proprietors; at a comparatively cheap rate, or for the purpose of raising a fund by subscriptions to enable the members to become owners of small portions of heritable property, freehold or leasehold, and were accordingly called benefit building societies. They appear to have originated at Birmingham about 1795. The first society of this kind in Scotland was founded under the patronage of the Earl of Sel-

kirk at Kirkcubright in 1815. In a few years similar societies started up in all directions; and they have increased so rapidly that they now number over 2800. These societies are of two chief kinds, either terminating, that is, limited to a certain term of years, and confined to a certain number of members; or permanent, that is, not confined to any definite number of members, but ready to receive new members as long as the society exists. In the first case the members all begin to pay their subscriptions at the same time, and these they repeat at stated intervals until the amount of the share which has been previously fixed has been entirely paid up by means of the subscriptions along with the interest upon them. As soon as this is done the society is practically at an end, and all that is left to do is for the society to arrange its affairs and pay to each of the members the shares to which he is entitled. When any member has received an advance from the society for the purpose of building a house for himself, for the purchase of land, or any other object, the amount of the advance as well as the amount of any burdens that may still be resting on his property is of course taken into account when the affairs of the society are wound up, and is deducted from the amount of the share or shares due to him; but when no advance has been made the member receives the full amount of his share. The duration of such a society may always be calculated beforehand from the amount of each subscription, the rate of interest paid for advances, and the value fixed for each share. As a rule they last from ten to fourteen years. One objection to this kind of society is, that while during the first years of its existence it is impossible to satisfy the numerous demands for loans made by the members, on account of the small amount of the subscriptions already paid in, during the last years of its existence, on the other hand, there is difficulty in finding members willing to receive advances from the society, since they prefer to wait for a time and receive an increased amount when the society is wound up. Permanent societies, by the constant admission of new members, have a constant supply of funds at their disposal, and are thus able to supply the demands of all the borrowers, while the security offered to investors by a well-managed society induces many people to enter the society merely with the view of having a convenient means of depositing their savings, and not with the intention of acquiring any real property for them selves. When the subscriptions of the members are not enough to meet the claims of borrowers, the society may itself borrow from other sources. When a society is fully organized, any member wishing to possess a small portion of real property has only to inform the society, which gets an estimate made of its value, and when satisfied with regard to that, supplies the applicant with the purchase-money, or effects the purchase in name of the applicant. He may enter at once into possession of the property, but of course the full rights of ownership do not belong to him until he has paid back the advance he has received from the society. This is done by instalments, which are usually paid once a month, and are in general made smaller or greater according to the ability of the borrower. The time within which the sum borrowed is paid back must of course depend upon the amount of each instalment compared with the whole amount of the debt. The amount paid annually in the way of instalments is not very much more than the ordinary rent of an equally good house, while the occupant has the satisfaction of knowing that at the end of a certain time the payments will cease entirely, and he will be owner of his own dwelling. The fact which makes

It possible for societies of this nature to be carried on successfully is that the ordinary rent of houses is higher than the interest which would be paid at the ordinary rates on the money which would buy the same houses. Were this not the case no advantage would be gained from the method of borrowing money to buy a house, because the borrower would have to pay a sum equal to the rent as interest, and all that helped to pay off the debt would have to be paid in addition. As it is, only part of an ordinary rent is absorbed by interest, while the other part, which increases at every payment, helps to clear off the debt entirely. Benefit building societies were put under the protection of the legislature in 1836 by 6 and 7 William IV. cap. xxiii., and about 70 societies, established before 1857, are still subject to the provisions of that act. All other societies are regulated by the Building Societies Act 1874-1894. By these statutes, the last of which was the result of the report of a select committee appointed in consequence of the position in which these societies had been placed by the disastrous failure of the Liberator Building Society, balloting for advances is prohibited, and the societies are placed under stringent regulations for securing publicity to their transactions, especially with regard to mortgages in arrears and properties in possession. Their total assets are £56,397,457, of which £43,350,439 is balance due on mortgage; £5,526,804 of these being mortgages in possession. There is reason to think, before the act of 1894 was passed, the properties in possession were as much as £7,500,000, and the diminution of two millions is probably due to the salutary influence of that act. That so large an amount should have had to be taken into possession by the societies through the default of their members indicates that the societies generally had fallen into a loose system of management.

Those building societies which take the form of proprietary companies, although comparatively rare in Great Britain, are by far the most common on the Continent. The first of the kind in Great Britain was founded in London in 1842, and there are now above thirty of them in existence in Great Britain and Ireland. By the Labourers' Dwellings Act of 1855 facilities were given for the formation of proprietary companies intended to afford cheap and suitable dwellings to the poorer classes, and regulations were passed as to the manner in which the houses were to be built. In France there have been similar societies since 1849, the largest and best known of which is that which was founded at Mulhausen in Alsace in 1853. In the same year a society was formed with similar objects in Switzerland. The oldest institution of the kind in Germany is that which was founded at Berlin in 1848, but the one at Frankfort (founded in 1860) also deserves to be mentioned on account of the great success with which it has been conducted. Some of the building societies of this kind merely aim at supplying good houses at a cheaper rent than usual, the houses always remaining the property of the company, and being occupied by tenants in the ordinary way. Others, like the benefit building societies, make it their object to enable the tenants to become in course of time the owners of the land and dwellings that they occupy. With this view a little more than the ordinary rent is charged, and while the ordinary rents are applied to the payment of a moderate interest on the capital invested in the company by the shareholders, the excess with the interest which accumulates upon it goes to defray the cost of the property, and when the full amount is paid up the tenant becomes owner. When all the tenants of the houses originally built by a company have in this

way become proprietors of the houses and land they occupy, the shareholders will have received back all the capital originally advanced by them, and thus either the company may be dissolved, or the money applied to the erection of new houses.

BUILTH, a small town of Wales, in Brecknockshire, delightfully situated on the Wye, in the midst of some of the finest mountain scenery of South Wales. The parish church is a building in the Norman style, with a tower of the fourteenth century. It was probably the Roman station *Bullonum*, and Roman relics are yet occasionally discovered there. Llewellyn, the last Welsh prince, was slain in the neighbourhood in an engagement between the Welsh and English. There are here remains of an old castle surrounded by a moat. Builth has mineral springs which are much frequented. Pop. (1891), 1383; (1901), 1805.

BUJALANCE, a city of Spain, in Andalusia, 21 miles N. by N. Cordova, on an elevated plain in a mountainous district. Manufactures—cloth and woollen fabrics, earthenware, and glass. Trade—exporting wheat, oil, and industrial produce, and importing wool. A large cattle-fair is held in August and September. Pop. (1897), 11,234.

BUKAREST. See *BUCHAREST*.

BUKOWINA. See *Supplement*.

BULAK, or **BOLAN**, in Egypt, the port of Cairo, on the Nile, about 1 mile distant from that city. It is irregularly built, and contains a custom-house, a fine palace, a school of languages, a celebrated printing-office, set up by Mehemet Ali in 1822, a large bazaar, &c. Goods are brought here from many parts of North-Eastern Africa, and the Cairo merchants come here every morning to make purchases. Its narrow streets present a busy and characteristically oriental scene. Pop. 5000.

BULACAN, a town of the Philippines, in the island of Luzon, capital of a province of same name, about 22 miles N.W. of Manila, and connected with the latter by an excellent road. The streets are spacious, and the houses of wood, with the exception of the church, the residence of the chief magistrate, and the government-house, all of which are of stone. Among the inhabitants are some wealthy sugar manufacturers; and a great many persons are employed in manufacturing various kinds of fabrics, particularly mats or carpets of silk. The environs of Bulacan are extremely picturesque. Pop. (1887), 12,370.

BULAMA, an island on the W. coast of Africa, one of the Bissagos. It is 18 miles long and 9 broad, and is situated about 2 miles from the mouth of the Rio Grande. It is very fertile, but not easy of access. The Bulama Association of Britain attempted to colonize it in 1792, but it was soon abandoned. It is now occupied by the Portuguese. See *BISSAGOS*.

BULANDSHAR, a town of India, in the N.W. Province, capital of dist. of same name, an ancient place quite modern in appearance. Pop. (1891), 16,931.

BULB, the name specially given to a kind of bud belonging to certain perennial herbaceous plants, and particularly to the monocotyledons. It is always underground, and is supported by a kind of solid and horizontal plate, lying between it and the true root. To this flattened portion the fleshy scales of which the bulb is externally formed are fixed by their base. The interior contains the rudiments of the flower-stalks and leaves. The outermost scales are thin and dry like paper, but they become more fleshy and succulent in the interior. Sometimes the scales are of one piece, a single scale embracing the whole circumference of the bulb, as in the onion and the hyacinth. They are then named 'coated' or 'tunicated bulbs'. At other times the

scales are smaller and free at the sides, and cover one another only in the manner of tiles on a roof, as in the white lily. Lastly, the coats are sometimes so close as to be confounded together, so that the bulb seems as if formed of a solid and homogeneous substance. Such bulbs are called 'solid', and they are exemplified in the common saffron. Bulbs again are either 'simple', as in the tulip or squill, or they are 'multiple', or formed of several small bulbs collected under the same envelope, as in garlic. Bulbs are reproduced every year, but differently in different species, the new bulbs sometimes being formed in the centre, sometimes at the side, sometimes above, sometimes below the old bulbs.

BULGARIA, a principality tributary to Turkey, and placed under the suzerainty of the sultan, constituted by the first article of the Treaty of Berlin, July 13, 1878. It is bounded north by Roumania and the Dobrudzha, east by the Black Sea, south by the Balkan Mountains, which separate it from Eastern Rumelia, and west by Servia. The Bulgarians are Christians of the Greek Church, but the eastern portion of the principality is inhabited mainly by Mohammedan settlers. The people are peaceful and industrious, and mostly engaged in agriculture, the soil being very productive. The revenue in 1899 was estimated at £3,364,000, and the expenditure at rather less. Military service is obligatory, and the war strength of the army is about 175,000. In accordance with the terms of the Treaty of Berlin a constitution (since amended) was drawn up for the new principality by an assembly of Bulgarian notables at Timova in 1879. The legislative authority is vested in a single chamber, called the Sobranie or National Assembly, the members of which are elected for a period of three years by universal manhood suffrage, in the proportion of one member for every 20,000 inhabitants. There is a ministry or cabinet of eight members, in whom the executive power is vested. The capital is Sofia. In 1879 Prince Alexander of Battenberg, cousin of the Grand-duke of Hesse, was elected prince by unanimous vote of the constituent assembly. In 1885 a national rising took place in Eastern Rumelia, the Turkish governor was expelled, and union with Bulgaria proclaimed. In consequence Servia became irritated against Bulgaria, demanded an addition to her own territory, and began a war against Bulgaria (Nov. 1885), in which she was severely defeated. By the treaty which followed, the Prince of Bulgaria was appointed governor-general of Eastern Rumelia for a term of five years, to be re-nominated at the end of that time by sanction of the great powers. These events greatly irritated Russia, by whose agency the prince was seized and carried off in 1886, while a proclamation was issued to the effect that he had abdicated. When Alexander was set free on Austrian territory his inclination was to return to his people, but he foresaw that this would lead to an armed Russian interference, and so he formally abdicated Sept. 7, 1886. In the following year Prince Ferdinand of Saxe-Coburg accepted an invitation to occupy the throne, and his position was subsequently formally recognized by the European powers. The area of Bulgaria proper is about 24,400 square miles. Pop. in 1893, 3,809,816; pop. of Eastern Rumelia, 922,386.

BULGARIANS, an ancient Tartar nation, which in the fourth century was settled on the Volga. The ruins of their former capital may still be seen in the neighbourhood of Kazan. Their kingdom, which occupied a part of the Asiatic Sarmatia of the Greeks, was called *Great Bulgaria*, and is now comprehended in the Russian government of Orenburg. They afterwards removed to the countries between the Bog and the Danube, and called their

territories *Second Bulgaria*. The first Bulgarian kingdom south of the Danube was founded in the latter half of the seventh century, but the Bulgarians who established it were comparatively few in number, and after their adoption of Christianity in the ninth century they became completely mixed up with the Slavonic inhabitants, though the whole became known as Bulgarians. The greatest ruler of this kingdom was Symeon (888-927), who subjugated the greater part of the peninsula, and raised the Archbishop of Bulgaria to a position independent of the Patriarch of Constantinople. Under the son of Symeon this empire fell to pieces. The western half broke off and formed a separate kingdom, with Oehrida in Macedonia for its capital; and the eastern portion was subdued by the Byzantine emperor, John Zimisces, who re-incorporated it with the empire. The western Bulgarian kingdom subsisted only till about 1018, when it also was subdued by Basil II., 'the slayer of the Bulgarians'. Towards the end of the twelfth century, however, the Bulgarians revolted, and managed to establish a third kingdom between the Balkan range and the Danube, which, sometimes weak and sometimes powerful, continued to exist till the advent of the Turks. The last ruler of this kingdom was conquered by Bajazet I. about 1390.

BULIMIA. The persons attacked by this disorder are tormented with an insatiable hunger. When their stomach is surfeited they are seen to faint, and throw off the food which they have taken half-digested, and with violent pain. It usually appears as a concomitant of other diseases. It occurs during certain intermittent fevers, in certain diseases of the stomach and bowels, particularly in such as are produced by the tape-worm.

BULK-HEADS, partitions built up between two decks of a ship, either lengthwise or across, to form and separate the various compartments.

BULL, an instrument, ordinance, or decree of the pope, treating of matters of faith or the affairs of the church, written on parchment on the rough side, and provided with a lead seal, upon the obverse of which the figures of St. Paul and St. Peter were impressed till the sixteenth century, after that the coat of arms of the reigning pope, and on the reverse side of which appears the name of the pope. In the case of those bulls which are issued between the election and consecration of a pope, the side on which the coat of arms is impressed is left empty. Such bulls were called *bulle dimidia*, that is, half-bulls. The word was originally the name of the seal itself. The papal bulls are commonly designated by the words with which they begin; for example, the bulls in *ocena Domini*, *Cum inter*, *Unigenitus*, *Ascendente*, &c. Certain ordinances of the German emperors are also called *bulls*. (See GOLDEN BULL.) A collection of bulls is called a *bullary*. Many of these bullaries have been published since the sixteenth century. The official collection of bulls is called '*Bullarium privilegiorum ac diplomatum Romanorum Pontificum usque ad Clementem XII.*' (thirteen vols. Rome, 1738-45), which has been continued under various titles to the end of the reign of Gregory XVI. (1846).

BULL-BAITING, the barbarous sport of setting dogs on a bull, which was tied to a stake and torn to death for the amusement of the spectators. In this case the dogs, which were set upon the bull singly, were trained to seize the bull by the muzzle, technically, 'to pin' the bull; but they were very frequently tossed on the horns of the animal. Sometimes also the bull was allowed to run loose in the arena, and then several dogs were set upon him at once. Bull-baiting was a favourite sport in England till about the time of George IV.

BULL-DOG, a variety of the common dog, called by naturalists *Canis molossus*, remarkable for its short, broad muzzle, and the projection of its lower jaw, which causes the lower front teeth to protrude beyond the upper. The head is massive and broad, and the frontal sinuses large. The lips are thick and pendulous; the ears pendant at the extremity; the neck robust and short; the body long and stout; and the legs short and thick. The bull-dog is a slow-motioned animal, better suited as a watch-dog than for any purpose requiring activity and intelligence. He is also said to be capable of great affection for his master. His fearlessness is well known, and in fighting, bull-dogs display the most indomitable spirit. They are apt to become vicious as they advance in years, but ordinarily a bull-dog is not more ready than any other dog to attack persons without some cause. The name was given to this dog on account of its being commonly employed in bull-baiting in the days when this barbarous sport was in vogue. The bull-terrier is a dog that partakes of the character of both the bull-dog and the terrier, and is rather a favourite among lovers of dogs.

BULLEN, ARMS. See **BOLTERN**.

BULLERS OF BUCHAN, a large oval cavity in the rocks on the east coast of Aberdeenshire, about 6 miles to the south of Peterhead, forming a sort of pot or caldron about 160 feet deep, open to the sky above and communicating with the sea below by a natural arch or horizontal passage, into which the waves often rush with a tremendous noise.

BULLEET, the projectile used for small-arms, either spherical or of an elongated form. The elongated bullet is now in general use for rifles, and there has also been introduced some means of dilating the bullet at the moment of explosion, so that it is forced into the grooves of the rifle and exactly fits the barrel. In some cases there is merely a cavity left at the base of the bullet into which the gases formed on the explosion of the gunpowder are forced, so that these have the effect of dilating the bullet in the manner required. In other cases a plug is inserted in the cavity, which is driven forward by the explosion of the gunpowder, and has the same effect. Spherical bullets remained in use long after the invention of the rifle, though several kinds of elongated bullets were suggested by various inventors of the seventeenth and eighteenth centuries. In 1837 the French adopted an elongated bullet invented by Delvigne, but this was superseded by the Minié bullet about 1846. A similar form, but with a wooden plug instead of an iron cup to cause the expansion, was introduced into the British army with the Enfield rifles of 1855. Previous to this, in 1841, the Prussians had adopted the celebrated needle breech-loading rifle, with an egg-shaped bullet resting on a thick wad which alone took the grooves of the rifle. In 1864 the three-grooved Enfield barrel was combined with the Snider breech-action in the rifles of the British army. The bullet supplied with this arm had a plug of baked clay and a hollow head, the lubrication being effected by bees'-wax placed in four cannelures running round its base. In 1866 the Chassepôt rifle was adopted by the French authorities, the bullet having shoulders serving the same end as the wad in the needle-gun bullet. The temporarily introduced Snider-Enfield rifles were replaced in 1874 by the much better Martini-Henry type, whose bullet, though longer and of smaller diameter, has the cylindrical form with domed end found in the French Chassepôt. The lubrication in this case was effected by a covering of wax-paper and a bees'-wax wad. The diminution in the diameter of the bullet was carried still further in the Enfield-Martini rifle of 1886, the bullets then supplied measuring

only about two-fifths of an inch in diameter; and in several subsequent types of rifle they are of still smaller diameter. This decrease in calibre has been accompanied by an increase in length in order to preserve the weight of the bullet, and it has also been found necessary to cover the lead of the bullet with a thin coating of some such metal as steel, copper, nickel, or German silver. These changes are all embodied in the bullets of the Lee-Metford magazine rifle at present in use in the British army, and the necessity for lubricators is thus done away with. The Lee-Metford bullet has a length of 3.05 inches, and the diameter of .312 inch. There is considerable variation in the weight of bullets. The old Brunswick bullets weighed 557, and its successor in Britain, the Minié, 680 grains. The Enfield bullet had a weight of 585 grains; the Snider and Martini-Henry, 480; the Enfield-Martini, 384, whilst the Lee-Metford bullet weighs only 216 grains. The French Lebel magazine rifle has a bullet with a weight of 216 grains, and in a later French form, the Berthier, the weight is 205 grains. The Lebel bullet is flattened at the point in order to lessen the risk of explosion in the magazine. The German Mauser and Mannlicher magazine rifles have bullets of the same weight as the Lee-Metford. The slenderness of the modern rifle bullets has necessitated the construction of rifles of very small bore, and this in turn has compelled the substitution of pellets of compressed powder for the older loose powder. In recent years a peculiar kind of bullet known as the Dum-Dum has been employed by British troops in warfare with uncivilized races, as the frontier tribes of India. In this the lead-core is inserted from the top, not from the base as in other bullets, and thus the lead, being unprotected at the point, has to sustain the shock of the impact. The consequence is that it expands in the wound, and thus, even though it should pass right through a person's body, its effects are very severe, and such as will most likely stop the onrush of the foe. See **RIFLE**.

BULL-FIGHTS, the favourite or national diversion of the Spaniards, as now practised said to be of comparatively modern origin, having been devised by the Moors of Spain mainly for the exhibition of horsemanship, courage, and dexterity with the lance. At first it was practised by gentlemen armed only with a short spear or javelin; and on grand occasions, especially the coronation of a king, such combats are still exhibited. But generally the combatants are professionals. The excommunications of the popes have not been sufficient to induce the Spaniards to abandon this amusement, cruel as it is. Charles IV. abolished it; but it was soon revived again. The assailants are seldom killed in these sports. Bull-fights are got up either for private gain or for the benefit of some public institution. They are exhibited at Madrid through the summer at least once a week for the benefit of the general hospital. The bull-fights are held in special rings or amphitheatres, that at Madrid being capable of seating 12,700 persons, its cost of erection having been £80,000. All the spectators, many of whom are ladies, are dressed in their best. The combatants march into the arena in procession, with some magistrate at their head. They comprise the *picadores*, combatants on horseback, in the old Spanish knightly garb; the *banderilleros*, combatants on foot, in short variegated frocks, with banners; and lastly, the *matador* (the killer). As soon as the signal is given the bull is loosed from the stall. The *picadores*, who have stationed themselves near him, commence the attack. Sometimes a horse is wounded, and the rider is obliged to run for his life. A peculiar kind of foot combatants, *chulos*, assist the horsemen by drawing the attention

of the bull with their banner; and in case of danger they save themselves by leaping over the wooden fence which surrounds the arena. The *banderilleros* then come into play. They try to fasten on the bull their *banderillas*—bollo tubes filled with powder, having strips of paper wound round them and small hooks at the ends. If they succeed the squibs which are attached to them are discharged, and the bull rears madly about the arena. The *matador* now comes in gravely, with a naked sword, and aims a fatal blow at the animal. If it is effectual the slaughtered bull is dragged away, and another is let out from the stall. If a bull is too inactive the dogs are set upon him; if he is too violent several horses are often killed. The bull is more furious in proportion as the heat of the weather is greater. Burlesque scenes accompany the spectacle: apes are trained to spring upon the neck of the bull, without his being able to reach them. Men of straw are set up before him, upon which he exhausts his strength. Some of the foot combatants likewise dress themselves grotesquely, to irritate the bull and amuse the spectators. See Doblado's Letters from Spain and Ford's Hand-book of Spain.

BULLFINCH (*Pyrrhula vulgaris*), a well-known European bird, which has a short, rounded, robust bill, a black cap, and plumage on the back of an ash or dark blue-gray colour: the inferior parts of the body are reddish. The female is of a grayish-red beneath. The bullfinch builds its nest in hedges and various trees, and feeds chiefly on different seeds and buds of fruit-trees, for which its strong thick bill is well adapted. The bullfinch is remarkable for the facility with which it is tamed and taught to sing, or even to articulate words. Bullfinches thus taught are sold at high prices, as much as £4 or £5 being demanded for a single bird. Its natural tones are soft, and when taught to repeat tunes by a bird organ, nothing can be imagined more delightfully sweet and clear than its piping. In captivity it appears to be rather a dull and quiet bird, though it displays much attachment to its feeder, showing evident marks of pleasure at his approach, and singing at his bidding. See Plate accompanying article ORNITHOLOGY.

BULLFROG. See FROG.

BULLHEAD, the common name of a fresh-water fish belonging to the genus *Cottus* (*Cottus gobio*, Linn.), which is abundant in nearly all the rivers and streams of Southern and Central Europe, as well as of Great Britain. It is characterized by a large and depressed head, two dorsal fins, with rays produced into short spines, and no swimming bladder. The bullhead, along with the other fresh-water species of the genus *Cottus*, is distinguished from the marine species by having the head almost quite smooth, there being only one spine on each side of the head on the preoperculum, while among the marine species the whole head is armed with spines or tubercles. The length of the bullhead is only 4 or 5 inches, and its colour is very dark. Its favourite resorts are clear streams, especially such as have stony bottoms, where it lurks among the stones. It is very voracious, and although it lives chiefly on insects, it will also devour any small fish that it can master. Its flesh is said to be very delicate, although many people have a repugnance towards it, owing to the disagreeable appearance of the fish. The spawning season is in March and April, and it is worthy of remark with regard to this fish, that while the female, after having deposited the spawn underneath some stone, pays no more attention to it, and will even devour its young, the male keeps guard over the spot, and will often engage in violent battle on behalf of its young, which it never leaves except for the purpose of obtaining food.

BULLIARD, PIERRE, a French botanist, born at Aubepierre en Barrois about 1742, was educated at the College of Langres, where he showed a decided taste for natural history, proceeded to Paris to pursue his medical studies, and employed his leisure in collecting the materials of a *Flora Parisiensis*, which he afterwards published in six vols. 8vo, with coloured plates. Among his other works are a *Herbar de la France*, and a *Dictionnaire Élémentaire de Botanique*, which has been repeatedly printed. He died at Paris in 1798.

BULLINGER, HENRI, a celebrated Swiss reformer, born at Bremgarten in 1504, studied first at Emmerich, in the duchy of Cleves, and afterwards at Cologne. His intention was to become a Carthusian monk, but after perusing the writings of Melancthon and other reformers he changed his views, formed a close connection with Zuinglius, became one of the most strenuous supporters of his views, and ultimately succeeded him in his charge of Zürich. He was one of the authors of the first Helvetic Confession, drew up in concert with Calvin the formulary of 1549, by which the differences between the churches of Zurich and Geneva on the subject of the Lord's Supper were happily terminated, and kept up a close correspondence with the principal English reformers. The Zürich Letters, lately published by the Parker Society, contains part of this correspondence, and among others, letters addressed to him by Lady Jane Grey. His numerous theological works form ten vols. folio. He died at Zürich in 1575.

BULLION is uncoined gold or silver, in bars, plate, or other masses. The word *bullion* was of frequent use in the proceedings respecting the Bank of England (see BANK), from 1797, when the order of council was issued that the bank should discontinue the redemption of its notes by the payment of specie to 1833, when specie payments were resumed; for, by a previous law, the bank was authorized to pay its notes in uncoined silver or gold, according to its weight and fineness. The investigations of the bullion committees, and the various speculations on the subject of bullion, related to the supply of gold and silver, whether coined or not, as the basis of the circulating medium. (See CURRENCY.) The discovery of the mines in America did not at first add materially to the stock of bullion in Europe. The total addition for the first fifty-four years was about £17,000,000; not quite so great an amount of value (in gold at least) as Russia has obtained from the Ural mines in less than half the time. The average annual supply from all the American sources during the fifty-four years from 1548 to the end of the sixteenth century, was rather more than £2,000,000. During the seventeenth century the annual average was about £3,250,000; in the next half century it was £5,500,000; and in the years 1750 to 1803 it was £7,600,000. The production of gold has been largely increased by the discovery of the Californian, the Australian (especially in recent times those of Western Australia), and the South African gold-fields. The world's production in 1897 was £51,706,000. See GOLD, SILVER, BIMETALLISM.

BULL TROUT (*Salmo erio*), a British fish closely allied to the salmon. It lives chiefly in the sea, but ascends rivers for the purpose of depositing its spawn. Its flesh is paler than that of the salmon, and is less esteemed. The weight of the bull trout is commonly under 15 lbs., but sometimes so much as 20 lbs. Its form is not so elegant as that of the salmon, being thicker at the head and nape of the neck, as well as at the tail. Its scales are smaller than those of a salmon of the same size.

BÜLOW, FRIEDRICH WILHELM, COUNT VON DEN NEWITS, royal Prussian general of infantry, knight of several military orders, &c., was born in 1756,

on his father's estate, Falkenberg, in Altmark. In his fourteenth year he entered the Prussian army, and in 1798 was appointed governor of Prince Louis Ferdinand of Prussia. In this capacity he served with distinction in the campaign on the Rhine. In 1798 his charge of the prince ended, and he received a battalion. In the war of 1806 he was a lieutenant-colonel at the siege of Thorn, and distinguished himself in various battles. In 1808 he was made major-general and general of brigade. When the war against France broke out in 1813, he fought the first successful battle, at Mœckern, April 5; May 2, took Halle, and protected Berlin from the danger which threatened it, by his victory at Luckau, June 4. After the armistice he commanded the third division of the army under the Crown-prince of Sweden, and saved Berlin a second time by the memorable victory of Großbeeren, Aug. 23. He relieved the same city a third time by the great victory at Dennewitz. For this service the king made him one of the few grand knights of the Iron Cross, and after the end of the campaign bestowed on him the title *Count Bülow of Dennewitz*, and made the same hereditary in his family. At the storming of Leipzig, Oct. 19, he took an important part. He distinguished himself equally in Westphalia, Holland, Belgium, on the Rhine, at Laon, and took Soissons and Laferre. After the peace he was commander-in-chief in East Prussia and Lithuania. At the opening of the campaign of 1815 he received the chief command of the fourth division of the army, with which he contributed so essentially to the victory of Waterloo, that the king gave him the command of the fifteenth regiment of the line, which was to bear in future the name of the *Regiment of Bülow von Dennewitz*. Jan. 11, 1816, he resumed the chief command in Königsberg, in Prussia, and died there, Feb. 25, 1816.

BÜLOW, HENRY VON, born at Falkenberg, in Altmark, about 1757, studied in the military academy at Berlin, and afterwards entered the Prussian service. But he soon retired, and occupied himself with the study of Polybius, Tacitus, and J. J. Rousseau, and then served for a short period in the Netherlands. He afterwards undertook to establish a theatre, but immediately abandoned his project, and visited the United States, from whence he returned poor in purse but rich in experience, and became an author. His first work was on the Art of War, in which he displayed uncommon talents. He wrote a book on Money, translated the Travels of Mungo Park, and published, in 1801, his History of the Campaign of 1800. In 1804 he wrote *Lehrsatze des neuern Krieges* (Theory of Modern Warfare), and several other military works, among which is *Tactics of the Moderns* as they should be. In the former he points out the distinction between strategy and tactics, and makes the triangle the basis of all military operations. This principle of his was opposed by Jomini, and other French writers. His history of the war of 1805 occasioned his imprisonment in Prussia, at the request of the Russian and Austrian courts. He died in 1807 of a nervous fever, in the prison of Rigä. He was a follower of Swedenborg.

BULRUSH, a popular name for tall, reed-like plants which grow in marshy places, and which for the most part belong to the genus *Scirpus*. The common bulrush is frequent in clear waters and about the borders of rivers throughout Europe, as well as in North America and New South Wales. The roots are thick and stout, creeping under water in the deep mud; the stems are of a dark-green colour, and 4 or 5 feet or more in height, and are naked, smooth, round, tough, pliant, and spongy within. Their base is covered with several sheathing scales, partly ending in leafy points. They are useful for packing and

thatching, and especially for plaiting into the bottom of chairs.

BULWARK. See BASTION.

BULWER, JOHN, a physician who flourished in England in the seventeenth century; appears to be entitled to the honour of having first pointed out a method of instructing the deaf and dumb. The work in which his method is explained is entitled, *Philosophus, or the Deaf and Dumb Man's Friend*, exhibiting the Philosophical Variety of that subtle Art which may enable one with an observant Ear to hear what any Man speaks by the moving of his Lips. This work was published in 1648, whereas Willis, to whom the invention has generally been attributed, published nothing on the subject till 1670. In connection with the same subject Bulwer published a *Chronomia*, or the Art of Manual Rhetoric; and a *Chirologia*, or the Natural Language of the Hand. A still more curious work is entitled *Anthropometamorphosis*, in which he shows the astonishing variety of forms and garbs exhibited by man in the different ages, and among the different nations.

BULWER LYTTON. See LYTTON (LORD).

BUM-BOAT, a small boat used to sell vegetables, &c., to ships lying at a distance from shore.

BUNDELGUND (more correctly *BANDALHAND*), a tract of country in Hindustan, consisting partly of certain British districts connected with the Northwest Provinces, and partly of a number of small native states subordinate to the Central India Agency. Its surface is considerably diversified, and there are several ranges of hills, some of which reach the height of 2000 feet. It has soil of every variety, which yields almost every grain and plant of India. Its waters are carried by different streams to the Jamna and so to the Ganges. The total area is 20,559 square miles, of which the British districts occupy 10,332. Pop. of the latter in 1891, 2,299,582.

BUNGALOW, an East Indian term for a kind of country-house with a thatched or tiled roof. Bungalows are generally of one story, though sometimes of two, and have always a verandah running round them to afford a shelter from the sun. They form the dwellings in which the Europeans uniformly reside. Public bungalows for travellers are maintained by government on the main highways.

BUNGAY, a market town, England, county Suffolk, on the right bank of the Waveney, 30 miles N.E. of Ipswich. It occupies the sides and summit of a gently rising hill, and is neatly and well built; streets spacious and well paved, diverging from a moderate-sized area in the centre of the town forming a market-place, in which is a handsome market-cross. Its churches are, St. Mary's, an elegant structure, with a beautiful steeple; and the Holy Trinity Church, a small ancient building with a round tower, and an ancient elaborately-carved pulpit. The principal trade is in corn, coal, flour, lime, and malt, in which a considerable amount of business is done. There is also an extensive printing-office and stereotype foundry. Adjoining the town is a very spacious common. Pop. in 1901 (of dist.), 5404.

BUNION, a small, hard, painful tumour which is formed in the neighbourhood of the joints of the toes, especially the metatarsal joints, and which consists in the swelling of the bones themselves, which fact distinguishes bunions from corns. It appears to be caused by the pressure of a boot or shoe which is too tight, especially when the feet are a little deformed. The best means to adopt in order to relieve the pain is to remove the causes of the tumor as soon as possible, to give rest to the foot, and to apply lotions and emollient poultices.

BUNION FLEXUOSUM, or *BULBOCISTANTUM* (*Pig-nut*), an umbelliferous plant which grows in

sandy and gravelly pastures, and produces one small, round, knotty tuber, which is edible, sweetish, and wholesome. It has some slight medical reputation, probably undeserved. The tuber is commonly known in Britain by the name of *earth-nut* or *arnut*, and is chiefly eaten by children. The foliage of the plant is very finely divided and subdivided, and the flowers are white.

BUNKER HILL, a name of some note in the history of the U. States, the place being the scene of the first important engagement in the revolutionary war. See **CHARLESTOWN**.

BUNSEN, **CHRISTIAN KARL JONAS**, CHEVALIER, a distinguished German statesman and philosopher, was born at Korbach, in the principality of Waldeck, on 25th August, 1791. From early youth he turned his attention to the science of philology, studying it under Heyne at Göttingen, and subsequently proceeding to Holland and Denmark, to acquire a critical knowledge of the Danish and Dutch languages. In the end of 1815 he made the acquaintance at Berlin of the celebrated Niebuhr, and in the spring of 1816 proceeded to Paris, where he studied Persian and Arabic under Sylvestre de Sacy. The same year he visited Rome, where he married, and renewed his intimacy with Niebuhr, then Prussian ambassador at the Papal court. Niebuhr procured for his friend the appointment of secretary to the Prussian legation, and on his quitting Rome in 1823, Bunsen was intrusted with the performance of his duties, and in 1827 formally accredited as resident Prussian minister. In this capacity he continued till 1838, and conducted several important negotiations with the Papal see, the result of one of which was the brief of Leo XII. relative to mixed marriages. His situation ceased to be agreeable after the commencement of the Cologne embroilments, which he vainly endeavoured to adjust, and he accordingly applied for a recall, which was granted, under the form of permission to make a journey to England. On his return from thence he received a mission to proceed to Berne as ambassador to the Swiss Federation. During his residence at Rome Bunsen had industriously pursued his philosophical and historical studies, including more especially that of the Platonic philosophy, and investigations into the religious and ecclesiastical history of mankind. The liturgies of the Church received his especial attention, and a service of his own framing, introduced by him into the chapel of the Prussian embassy at Rome, was printed by order of the King of Prussia, who himself wrote a preface to it. This work was published without the author's name, at Hamburg in 1846, under the title of *Allgemeines evang. Gesang-und Gebetbuch* (General Hymn and Prayer Book of the Evangelical Lutheran Church), and may be regarded as a new edition of the *Vernuch eines allgemeinen evang. Gesang-und Gebetbuchs*, published at Hamburg in 1838.

In 1841 Bunsen was summoned to Berlin from Switzerland to proceed to England in charge of a mission for the establishment, in conjunction with that country, of a bishopric at Jerusalem. Shortly afterwards he was nominated Prussian ambassador in England. On the occasion of a visit to Berlin in 1844 he was consulted on the subject of granting a constitution to the country, and is said to have drawn up and submitted to government the form of one which bore a very close resemblance to that of Great Britain. In the matter of the Schleswig-Holstein question he strenuously supported, in his capacity of English ambassador, the claims of Prussia and the German Confederation in opposition to those of Denmark. From the opposite views taken by him to those of his government in relation to the Russian war he was recalled from London in 1854, and aban-

doning politics, retired to Heidelberg to devote himself exclusively to literary pursuits. The results of these have established his reputation as one of the most profound and original critics in the department of biblical and ecclesiastical history. Among these are, *Die Verfassung der Kirche der Zukunft* (The Constitution of the Church of the Future), Hamburg, 1845; *Ägyptens Stelle in der Weltgeschichte* (Egypt's Place in the World's History), Hamburg, 1846; *Hippolytus und seine Zeit* (Hippolytus and his Time), London, 1851; and lastly, his greatest work, *Bibelwerk für die Gemeinde* (Bible Commentary for the Community), the first part of which was published in 1858, and was intended to be completed in 1862. It had occupied his attention for nearly thirty years, and, as he informs us, was regarded as the grand centre-point to which all his literary and intellectual energies were to be devoted. Death interposed to prevent him completing his undertaking. For some years the state of his health had been such as to cause anxiety to his family; and with the view of restoring it he was recommended to try the effects of a more genial climate. He accordingly spent the winters of 1858-59 and 1859-60 at Cannes, in the s. of France, returning from thence in the spring of 1860 to Bonn, whither he had recently transferred his abode from Heidelberg. His sojourn in the s. had effected no lasting improvement, and by the month of October it was evident that he was sinking fast. He expired on the morning of 28th November, 1860. Three volumes of his *Bibelwerk* had been published at his death (the first, second, and fifth), and this great work was completed in his spirit and by the aid of his manuscripts under the editorship of Holtzmann and Kamphausen, in nine volumes (1868-70).

BUNT, the middle part or cavity of the principal square-sails, as the main-sail, fore-sail, &c. If one of them be supposed to be divided into four equal parts, from one side to the other, the two middle divisions, which comprehend half of the sail, form the limits of the bunt.

BUNT, sometimes called **SMUT BALL**, **PEPPER BRAND**, and **BRAND BLADDERS**, the most formidable diseases, perhaps, to which wheat is subject, but one which may in most instances be greatly modified, and which seldom in the present day does material injury, except where there is careless cultivation. Like many other of the diseases to which the cereal plants are subject, it arises from the attack of a parasitic fungus (*Uredo caries*). It is generated in the ovary of wheat and a few other Gramineae, and very rarely on the stem. It is formed at an early stage of growth, before the ear is free from the sheath; and indeed the plants which are affected by the parasite may be readily recognized by their unusual luxuriance, being generally several inches higher than plants not affected, larger in bulk, and often producing a greater number of stems from the same root. The bunted grains are shorter and blunter than the sound, of a dark-green when young, but when old of a pale brown, or sometimes nearly black. The contents of the ovary are reduced to a uniform black powder or paste, which has an offensive smell like that of decayed fish. Various substances have been used by cultivators to prevent the growth of bunt, such as salt, quicklime, arsenic, corrosive sublimate, &c. Careful washing and a selection of good seed will alone prevent much mischief, but it is advisable to take some more stringent measures with a view to destroy the vitality of the bunt spores. For this purpose Dombale's method is the most successful. It consists in thoroughly wetting the grain with a solution of sulphate of soda (Glauber's salts), then drying the wheat with quicklime, which combines with the water to make sulphate of lime (gypsum), which acts as a manure,

while the caustic soda destroys the vegetative powers of the bunt spores.

BUNTER SANDSTEIN. See **GEOLOGY.**

BUNTING, a thin woollen stuff, of which flags are usually made; hence, flags, collectively.

BUNYAN, JOHN, author of the Pilgrim's Progress, was the son of a tinker, and was born at the village of Elstow, near Bedford, in 1628, being baptized on Nov. 30th. He came of a family which had long been established in Bedfordshire, and was the first son of the second marriage of his father, Thomas Bunyan, his mother's name being Margaret Bentley. After receiving a very scanty education, he followed his father's employment, and for some time led a wandering, irregular life. During the civil war he served as a soldier, most probably in the army of the Parliament; and his mind now became impressed with a deep sense of religion. This reformation in his life was powerfully assisted by the piety of his wife, whom he married in 1648 or 1649, and who died some seven years later. He joined a nonconformist body at Bedford, and at length in 1657 formally undertook the office of a public teacher among them. Acting in defiance of the severe laws enacted against dissenters from the Established Church after the Restoration, Bunyan was arrested not far from Bedford on Nov. 12th, 1660, and committed for trial to the county jail. He was indicted at the quarter-sessions early in 1661, and after an irregular trial was sentenced to three months' imprisonment, which was to be followed by banishment if he persisted in his determination to repeat his offence. He could not be induced to moderate his zeal, and consequently, though not banished, he lay in prison almost continuously till 1672. To this confinement he owes his literary fame, for, in the solitude of his cell, his ardent imagination, brooding over the mysteries of Christianity, the miraculous narratives of the sacred Scripture, and the visions of Jewish prophets, gave birth to that admired religious allegory, the Pilgrim's Progress—a work which, like Robinson Crusoe, has remained unrivalled amidst a host of imitators. A recent biographer, the Rev. J. Brown, is, however, of opinion that Bunyan's greatest work belongs to a subsequent six months' imprisonment in 1675. The first edition appeared in 1678, but in the editions of 1679 and 1680 many of the most celebrated characters appeared for the first time. The second part of the work, describing the journey of Christian's wife and children, was published in 1684. His Holy War made by Shaddai upon Diabolus (1682), his other religious parables, and his devotional tracts, which are numerous, are also remarkable, and many of them valuable. There is a curious piece of autobiography of Bunyan extant, entitled Grace abounding to the Chief of Sinners (1666). On obtaining his liberty, Bunyan resumed his functions as a minister at Bedford, and became extremely popular. He died during a visit to London on Aug. 31st, 1688. In 1692 Bunyan's friend, Charles Doe, began a folio edition of his works, which was not, however, completed; and the first complete edition did not appear till 1736. Another was published in two vols. folio in 1707, and since then several have appeared. Of lives we may mention those by Southey (1830), Macaulay (1853), Offor (1862), Venables (1879), Froude (1880, English Men of Letters), Copner (1883), and Brown (1885; new edition, 1888).

BUNZLAU.—1. A town of Prussia, in the province of Silesia, near the Bober, 25 miles w. of Liegnitz. It was formerly surrounded by fortifications, but handsome promenades now cover most of the area once occupied by them. In the market-place is an iron obelisk to the Russian general Kutusov,

who died here in 1819. Earthenware, glass, iron, &c., are manufactured. Pop. (1895), 13,870.—2. **JUNO BUNZLAU**, a town of Bohemia, 31 miles n.e. of Prague, the capital of the circle of Bunzlau, stands on the left bank of the Iser, is well built, and has an old castle, an old and a new town-house, and other interesting buildings. Its inhabitants are chiefly engaged in manufacturing cottons, woollens, starch, sugar, spirits, beer, &c. Pop. (1890), 11,618.—3. **ALT BUNZLAU** is a small town of Bohemia, situated on the Elbe.

BUONAPARTE. See **BONAPARTE.**

BUONAROTTI, MICHEL ANGELO. See **ANGELO.**

BUONTALENTI, BERNARDO, surnamed *Delle Girandole*, a painter, sculptor, and architect, was born at Florence in 1536, and died in 1608. When he was eleven years of age an inundation of the Arno broke into the quarter of Florence where his family resided, and carried off every member of it except himself. Cosimo de' Medici, on learning the disaster, received him into his palace, and improved the taste which he had displayed for drawing by placing him in the schools of Salvati, Bronzino, and Vasari. He displayed great versatility of mind, and excelled not only in the kindred arts of painting, sculpture, and architecture, but distinguished himself as a mathematician, a military engineer, and an inventor of machines.

BUOY, any floating body employed to point out the particular situation of anything under water, as of a ship's anchor, a shoal, &c. They are of various shapes and constructions. The *can-buoy* is of a conical form, and painted with some conspicuous colour; it is used for pointing out shoals, sand-banks, &c. The *caak-buoy* is in the form of a caak; the larger are employed for mooring, and are called mooring buoys. A *bell-buoy* is a large fixed buoy to which a bell is attached and is caused to sound by the heaving of the sea, serving as a signal in foggy weather. The *life or safety buoy* is intended to keep a person afloat till he can be taken from the water. Gas-buoys are charged with compressed gas, and provided with a suitable burner. The gas being lighted, and burning continuously, such buoys serve as a guide at night. See article on **LIFE-BUOYS, LIFE-BARTS, &c.**

BUPALUS, a sculptor and architect of Chios, who seems to have flourished about B.C. 500. He executed several fine works for the city of Smyrna, and particularly the Three Graces in gold. His quarrel with Hipponax, a celebrated satirical poet, is well-known. See **HIPPONAX.**

BUPHAGA, a genus of birds of the starling family (Sturnidæ), whose species are found in various parts of Africa, where they are of great use from their habit of feeding on the parasites infesting cattle. They are popularly known as *beef-eaters* or *ox-peckers*, and are distinguished from the true starlings by a stouter beak, bare nostrils, more curved claws, and some other characters. The South African ox-pecker (*B. africana*) inhabits Natal, whilst farther north the genus is represented by a red-billed species (*B. erythrorhynchos*). A third species is found still farther north and also in the Transvaal.

BUPRESTIDÆ, a family of coleopterous insects (beetles), many of which are remarkable for the splendour of their appearance. This family is included in the pentamerous section of Coleoptera, which was formed by Latreille, and so named because the members of it have five joints in the tarsi. The characters of the Buprestidæ are: body ovate, elongated, somewhat broad and obtuse in front, but pointed behind; eyes oval, with the antennæ inserted between them; jaws powerful. They walk slowly, but fly with great rapidity, especially in warm weather. They are very fond of sunning themselves on bushes, or the branches

of trees. When one attempts to seize them, sometimes even when one approaches them, they allow themselves to fall suddenly to the earth, or fly rapidly away. There are several hundred species belonging to this family, most of which are found within the tropics, and the tropical species are those which are chiefly distinguished by the brilliancy of their colours. The prevailing colour appears to be green, but species are often found of a blue, red, golden, or other colour. The *Buprestis piqua* of Linnaeus, which is about 2 inches in length, and one of the largest of the family, has bright golden elytra, or wing-cases, which are often used as ornaments by the inhabitants of South America, of which continent it is a native.

BURBOT, or **BURBOIT** (*Lota vulgaris*), a fresh-water fish of the same genus as the ling, and belonging to the Gadidae or cod family, of which it is the only British fresh-water species. It has an elongated body covered with small scales, and also with a numerous secretion; a small head; two dorsal fins, of which the second is very long and reaches to the base of the tall fin, which is oval and slightly pointed; a long anal fin, and a single barbule on the lower jaw. In length it sometimes attains 2 feet, and it is said to have been found 16 or even 20 lbs. in weight; but they are never found nearly so large, except in large lakes. The ordinary weight is about 2 lbs. The colour is yellowish-brown, rather dark, and marked with spots on the upper parts, but lighter underneath. In England it is found in the Trent, Cam, and other rivers on the eastern side; in Scotland it is not found at all. It is more abundant in the rivers and lakes of the Continent than in the British Isles, and it is particularly plentiful in the Upper Rhine and the Danube and its tributaries. In Switzerland it has been found more than 2200 feet above the level of the sea. It is also found in the rivers of Siberia and the large fresh-water lakes of Central Asia, and it is said that it is sometimes seen even in India. It always prefers deep streams with clear water, and hence it is not found in small rivers unless they are deep. It generally feeds by night, and by day it lurks under stones or other bodies. It is extremely voracious, and is the terror of all smaller fish, not excepting those of its own species. In Switzerland its flesh is much prized as an article of food, but in England it is not so highly esteemed. Among the Ostiaks the skin of the burbot is used instead of window-glass, and among other Siberian tribes it is used to make coats, shoes, and other articles of clothing. See plate at ICHTHOLOGY.

BURCHIELLO, **DOMENICO**, an eccentric poet. Of the circumstances of his life we know but little. He lived at the beginning of the fifteenth century, at Florence, where he was probably born. He was the son of a barber named Giovanni, and was called originally only Domenico. He assumed the name of Burchiello afterwards for reasons that cannot be assigned. His fame began about 1425. He was first registered as a barber in 1432. Some writers have reproached him for shameful vices, and represented him as a low buffoon who did everything for money. Others have defended him. His shop was so famous that learned and unlearned, high and low, assembled there every day, and Cosmo the Great caused it to be painted on one of the arches of his gallery. It appears here divided into two portions; in one Burchiello is acting the part of a barber; in the other that of a musician and poet. The portrait of Burchiello himself is painted over his shop. It is extremely difficult to decide upon the absolute value of his satires, as the local and personal allusions in them are obscure. They were composed for his contemporaries, with a studied obscurity and extravagance of expression. His style is, nevertheless, pure

and elegant. His burlesque sonnets are enigmas, of which we have no intelligible explanation, notwithstanding what Doni has done. The narrative and descriptive parts are very easy to be understood; but the wit they contain is, for the most part, so coarse, that the satire fails of producing its effect. They are, on the whole, lively, but licentious. The best editions of his sonnets are those of Florence, 1568, and of London, 1757.

BURCKHARDT, **JOHANN KARL**, one of the first astronomical calculators in Europe, was born at Leipzig, April 30, 1773, and acquired a fondness for astronomy from the study of the works of Lalande. He applied himself particularly to the calculation of solar eclipses, and the occultation of certain stars, for the determination of geographical longitude. He made himself master, at the same time, of nearly all the European languages. Professor Hindenburg induced him to write a Latin treatise on the Combinatory Analytic Method (Leipzig, 1794), and recommended him to Baron von Zach, with whom he studied practical astronomy at his observatory on the Seeberg, near Gotha, and whom he assisted, from 1795 to 1797, in observing the right ascension of the stars. Von Zach recommended him to Lalande, at Paris, who received him at his house, Dec. 15, 1797. Here he distinguished himself by the calculation of the orbits of comets, participated in all the labours of Lalande, and those of his nephew, Lefrançois Lalande, took an active part in the observatory of the Ecole Militaire, and translated the first two volumes of Laplace's *Mécanique Céleste* into German (Berlin, 1800-2). Being appointed adjunct astronomer by the board of longitude, he received letters of naturalization as a French citizen, Dec. 20, 1799. His important treatise on the comet of 1770, which had not been visible for nearly thirty years, although, according to the calculations of its orbit, it should have returned every five or six, was rewarded with a gold medal by the Institute in 1800. This treatise, which proposed some improvements in Dr. Olbers' mode of calculation, is contained in the *Mém. de l'Institut*, 1806. During this year he was made a member of the department of physical and mathematical sciences in the Academy; in 1818 was made a member of the board of longitude, and, after Lalande's death, astronomer in the observatory of the military school. In 1814 and 1816 he published in French, at Paris, Tables to assist in Astronomical Calculations. He also wrote some treatises in Von Zach's *Geographical Ephemerides*. His labours in the board of longitude were particularly valuable. He died in 1825.

BURCKHARDT, **JOHANN LUDWIG**, a celebrated traveller, was descended from a respectable family in Bâle, and born at Lausanne in 1784. As he was unwilling to enter into the service of his country, at that time oppressed by France, after having completed his studies at Leipzig and Göttingen, he went to London in 1806, where the African Association wished to make a new attempt to explore Africa, from the N. to the interior, in the way already trodden by Hornemann. They received Burckhardt's proposal to undertake this journey in 1808. Burckhardt now studied the manners of the East, and the Arabian language, in their purest school, at Aleppo. He remained two years and a half in Syria, visited Palmyra, Damascus, Lebanon, and other regions; after which he went to Cairo, in order to proceed with a caravan through the northern part of Africa to Fezzan. In 1812 he performed a journey up the Nile, almost to Dongola; and afterwards, in the character of a poor trader, and a Turk of Syria, proceeded through the deserts of Nubia (where Bruce had travelled before him), under great hardships, to

Barbera and Shendy, then east to Suakin, whence he passed over to Jeddah, and thence to Mecca. He was now so well initiated into the language and manners of the Arabians, that, when a doubt arose concerning his Islamism, after having passed an examination in the theoretical and practical parts of the Mohammedan faith, he was acknowledged a very faithful and a very learned Mussulman. He was the first Christian or European to visit the holy city of the Mohammedans, and had his real character been discovered there is little doubt death would have been the result. After spending three months (September, October, and November of 1814) at Mecca he visited Medina. In 1815 he returned to Cairo, and afterwards visited Sinal. He was preparing to make an exploratory journey in the region of the Niger sources when he died at Cairo, April 15, 1817. The Mohammedans performed his obsequies with the greatest splendour. He had previously sent home all his journals. His *Travels in Nubia* were published in London (1819) by the African Association, with his *Researches into the Interior of Africa*. In 1822 his *Travels in Syria and the Holy Land* were published, and in 1829 his *Travels in Arabia*. In 1830 another volume from his papers appeared, entitled *Arabia Proverbs; or, the Manners and Customs of the Modern Egyptians Illustrated*.

BURDETT, SIR FRANCIS, politician, was born on Jan. 25th, 1770, and educated at Westminster, and after two years at Oxford made a Continental tour. In 1796 he obtained a seat in Parliament through the patronage of the Duke of Newcastle; but he soon abandoned the Tory party, and made himself conspicuous by his advocacy of liberal measures. In 1802 he stood for Middlesex, but though at first elected, he finally lost his seat in 1806, after much costly litigation. He was more successful in 1807 at Westminster, where his election at the head of the poll was hailed as a great popular triumph. In 1810 he published a letter in Cobbett's Political Register, denying the right of the House of Commons to imprison for libel, as they had recently done in the case of John Gale Jones. This letter having been brought under the notice of the house was declared a gross breach of its privileges, and a warrant was issued by the speaker for the committal of Sir Francis to the Tower. He denied the legality of the warrant, and declared his determination to surrender only to force. The public mind was strongly agitated; but prorogation of Parliament relieved him from his imprisonment in the Tower, and he became perhaps the most popular man in the kingdom. In attaining this popularity he was greatly aided both by the graces of his appearance and the talents which he undoubtedly possessed. Ultimately, however, his fervour cooled, and he owed his last seat in Parliament to the Conservatives of Wiltshire. He died on Jan. 23rd, 1844. Lady Burdett, who had been fifty years married to him, had died only ten days before. She was the youngest daughter of Mr. Thomas Coutts, the wealthy London banker. (See COUTTS.)—ANGELA GEORGINA, the youngest daughter of Sir Francis, came into a great part of the fortune of her grandfather, and in 1871 was created a peeress in her own right as Baroness Burdett-Coutts. She was born on April 21st, 1814, and has become deservedly popular from the excellent use she has made of her ample means. She erected and endowed the church of St. Stephen at Westminster, and it was by her liberality also that the bishoprics of Adelaide, Cape Town, and British Columbia were established. Several of what were the most wretched districts of London have been enormously improved through her generosity, and the home established by her at Shepherd's

Bush rendered great assistance to many unfortunate women. In 1877 she founded the Turkish Compassionate Fund to relieve the sufferings of peasants in Turkey, and in recognition of her services the Sultan conferred on her the Order of the Medjidieh. In 1881 she married Mr. Ashmead-Bartlett, who assumed the name of Burdett-Coutts.

BURDETT-COUTTS. See preceding article.
BURDOCK (*Arotium Lappa*), a species of plants belonging to the natural order Compositae. It has a branched stem, about 8 feet high, bearing many large, heart-shaped, wavy, coarse leaves, and flower-heads, which, when ripe, become so hard and hooked, that they will stick to the hair or clothes, and are known by the name of burr. The whole plant is covered with a clammy, bitter substance, from which circumstance it was called, in Old English, the clot-bur. The root, which is fleshy and tap-shaped, is sometimes used medicinally as a diuretic. As the plant grows only in deep, rich soils, its prevalence may be regarded as an indication of good land.

BURDWAN, or BARDWAN, a town of Hindustan, capital of a division of the same name in the lower provinces of Bengal, on the left bank of the Damoda, 68 miles north-west of Calcutta, with which it is connected by railway. There is a titular rajah of Burdwan, who resides here in a spacious palace, with gardens, &c.; and there are also a large collection of temples and a shrine of Pirba-haram. Pop. (1891), 34,477. The division has an area of 13,956 square miles, and a pop. (1891) of 7,688,818, and is divided into the districts of Burdwan, Bankura, Birbhum, Hugli, Midnapur, and Howrah. The chief crops are sugar, indigo, tobacco, cotton, and the usual cereals. Mulberry-trees are cultivated, and coal is raised.

BUREAU, a word often used to signify the chamber or official apartments of an officer of government, and the body of subordinate officials who labour under the direction of a chief.—*Bureau system*, or *bureaucracy*, is a term often applied to those systems of government in which the business of administration is carried on in departments, each under the control of a chief; and is opposed to those in which the officers of government have a co-ordinate authority. Sometimes a mixture of the two systems is found. Thus the business of the executive branch of government may be carried on by bureaux, while the administration of justice is in the hands of co-ordinate judges.—The *Bureau des Longitudes* in France is charged with the publication of astronomical and meteorological observations, and the publication of the *Connaissance des Temps*. See ALMANAC.

BURG, a town of Prussia, in the province of Saxony, 12 miles N.W. of Magdeburg, on the Elbe, where it joins a canal uniting the Havel with the Elbe. It has four churches, a hospital, a gymnasium, and a well-endowed institution for the bringing up of orphan children, and is the seat of civil and judicial administration for the circle. Its manufactures are extensive, especially of woollens, for which it was a centre as early as the twelfth century. Cloths for army purposes are largely made. There are also spinning-mills, dye-works, machine-works, tanneries, oil-works, &c. Pop. in 1895, 19,397.

BURG.—J. ADRIAAN VAN DER, a painter, born at Dordrecht in 1803, studied under Arnold Houbraken, distinguished himself by his portraits, and acquired a reputation which would soon have procured him an independence. But intemperate habits rendered his talents of no avail, and hurried him to a premature grave in 1783. His freedom of touch and fine colouring are his distinguishing excellences. His best-known pieces are two large pictures at Dordrecht, one of which gives on a single canvas portraits of the managers of the orphan hospital, and the other

portraits of the officers of the mint.—2. JOHANN THIAS, a celebrated astronomer, born at Vienna in 1766, attracted the notice of Van Swieten, who was then at the head of the commission appointed to reform the scholastic establishments of Austria, and through his patronage obtained the means of prosecuting the study of mathematics, and more especially of astronomy, for which he showed a decided inclination. In 1791 he became professor of physics at Klagenfurt, and in 1792 was appointed colleague of Triemerer at the observatory of Vienna. In 1798, the French Institute having proposed a prize for the determination, by at least 500 observations, of the mean height of the apogee and ascending node of the moon, Burg sent in a memoir in which the determination was made by a most accurate and ingenious method, not after 500 but 8000 observations. The tables contained in it were afterwards published by the Institute, and constitute the chief foundation of his fame. In 1818 he became almost entirely deaf, and retired from public life to Wicennau, in the upper valley of Laran in Carinthia. He died in 1884.

BURGAS, or BOURGAS, a seaport of European Turkey, on the Black Sea, in the province of Eastern Roumelia. The bay on which it stands is of sufficient depth for large vessels, and the exports are grain, iron, butter, wine, and also woollen goods for Constantinople. The principal source of the prosperity of the town is the manufacture of pottery, pipe-bowls, cups, &c., for which a superior clay is found in the neighbourhood. Pop. (1888), 5749.

BÜRGER, GOTTFRIED AUGUST, a celebrated German poet, was born Jan. 1, 1748, at Wolmerowende, near Halberstadt, where his father was a preacher, and died June 8, 1794, at Göttingen. Before his tenth year he learned nothing but reading and writing, but showed a great predilection for solitary and gloomy places, and began early to make verses, with no other model than that afforded by hymn-books. He learned Latin with difficulty. In 1764 he studied theology at the University of Halle, and in 1768 he went to Göttingen, in order to exchange theology for law, but soon formed connections here equally disadvantageous to his studies and his morals, so that his grandfather, who had hitherto maintained him, withdrew his support from him. The friendship of several distinguished young men at the university was now of great service to him. In union with his friends he studied the ancient classics and the best works in French, Italian, Spanish, and English, particularly Shakespeare, and the old English and Scottish ballads. Percy's *Reliques* was his constant companion. His poems soon attracted attention. In 1772 he obtained, by the influence of Boie, the small office of baille in Alten-Gleichen, and, by a reconciliation with his grandfather, a sum for the payment of his debts, which he unfortunately lost, and during the rest of his life was involved in pecuniary difficulties. In 1774 he married the daughter of a neighbouring baille, named Leonhart, but his marriage was unfortunate. He conceived a violent passion for the sister of his wife, and married her, in 1784, soon after his first wife's death. She also, his celebrated *Molly*, died in the first year of their marriage. At the same time he lost his little property by imprudent management, and was obliged, by intrigues, to resign his place. He was made professor extraordinary in Göttingen, but received no salary, and this favourite poet of the nation was obliged to gain a living for himself and his children by poorly-rewarded translations for booksellers. A third marriage, in 1790, with a young lady of Swabia, who had publicly offered him her hand in a poem, completed his misfortunes; he procured a divorce from her two years afterwards. The government of Hanover afforded him some assistance

shortly before his death, which took place in June, 1794, and was occasioned by a complaint of the lungs. In the midst of these misfortunes and obstacles it is astonishing how much he did. He has left us songs, odes, elegies, ballads, narrative poems, and epigrams. In none of these departments does he hold a low rank; in some the public voice has placed him in the first. Schiller criticised him very severely; he denied him the power of idealizing, and reproached his muse as being of too sensual a character. The judgment of A. W. Schlegel seems more just: he says, 'Bürger is a poet of a more peculiar than comprehensive imagination; of more honest and plain than delicate feelings; his execution is more remarkable than his conception; he is more at home in ballads and simple songs than in the higher lyrical poetry; yet, in some of his productions, he appears as a true poet of the people, and his style, with some faults, is clear, vigorous, fresh, and sometimes tender.' The first collection of his poems appeared in Göttingen, 1778. His complete works were first published by Reinhard in 1796–98 (Göttingen, four vols.), whose edition has been repeatedly published since. Other editions of his works and letters have also been published, and his life has been written by Döring, Prohle (G. A. Bürger. Sein Leben und seine Dichtungen, Leipzig, 1865), and others.

BURGESS, a word used in somewhat varying senses, but generally implying a person invested with all the privileges of a citizen in a borough or corporate town. Those entered on the *burgess roll* of English boroughs are householders who have resided and paid rates for twelve months prior to July in any year. See *BOROUGH, BURG*.

BURGH, the Scotch term corresponding to the English 'borough,' and applied to several different kinds of corporations, and to towns and cities in Scotland. The different kinds of burghs that still exist, or formerly existed in Scotland, are 'royal burghs,' 'burghs of barony,' 'burghs of regality,' 'free burghs,' 'parliamentary burghs,' and 'police burghs.' The last two have been created in comparatively recent times.

ROYAL BURGH. A royal burgh is a corporate body erected by a charter from the crown. The corporation consists of the magistrates and burgesses of the territory erected into the burgh. The magistrates are generally, a provost and bailies, dean of guild, treasurer, and common council. With regard to the method of electing councils, the 'close system' formerly prevailed, until it was abolished by 8 and 4 Will. IV. cap. lxxvi. This system existed by right of an enactment made in 1469, which gave to the old councils the privilege of electing their successors, and which also decreed that the office-bearers of the town, as aldermen, bailies, dean of guild, &c., should be elected by the members both of the old and the new council, in conjunction with a number of persons belonging to the several crafts of the burgh, each of whom was elected as their representative by the craft to which he belonged, one for each craft. This system, however, was not universally adopted, and the 'setts,' or constitutions of the burghs exhibited an almost endless variety in their details, but all of them agreed in the essential principle of the close system, that of self-election. The act mentioned above, which abolished this system, substituted for it a popular mode of election, according to which every one is entitled to vote in the election of councillors, who has resided for six calendar months next previous to the last day of June, within the royalty, or within 7 miles of it, and who is qualified to vote in the election of the member of Parliament. In those burghs which do not now send or contribute to send members to Parliament, the same qualification is

required to entitle one to vote in a municipal election as is required in those which do return members to Parliament. The number of councillors in each burgh remains the same as the number which constituted the common council, by the sett or constitution of the burgh, as it existed when the act was passed, and where this was variable, the smallest number was to constitute a council. Formerly the electors of eight burghs only—Edinburgh, Glasgow, Aberdeen, Dundee, Perth, Dunfermline, Dumfries, and Inverness, were divided into wards or districts, each of which was represented by a certain number of members in the council. But by the Municipal Elections Act of 1868, it was further enacted that any royal burgh having, by the last census, a pop. of more than 10,000 persons, and not divided into wards, might, by a majority of two-thirds, resolve that the burgh should be divided into wards, for the purpose of parliamentary and municipal elections. At the first election after the passing of the act 2 and 3 Will. IV. cap. lxxvi., a complete council was erected by each burgh, but as the terms of the act required that a third part of the members should retire every year, the same proportion of members must now be annually elected. There is no bar to the re-election of an outgoing councillor. In addition to the members of council thus elected, the deans-guild and deacons-conveners of the trades in Edinburgh, Glasgow, Aberdeen, Dundee, and Perth, are constituent members of the town-councils of these burghs. Upon the third lawful day after an election of councillors, the office-bearers of the burgh are elected by the councillors, by a plurality of voices, the first attending councillor having a casting vote in cases of equality. Vacancies taking place during the year, by death or resignation, are supplied, *ad interim*, by the remaining members of council, but those who are thus chosen only hold office till the next election of councillors. The magistrates and council possess the same powers of administration and jurisdiction as was enjoyed by the magistrates and town-council before the passing of the act. An annual convention which meets at Edinburgh, and is composed of commissioners from each of the royal burghs, has power to make regulations for promoting the trade and commonweal of the burghs, and also to inquire how the revenues have been applied, although it has no power to call the magistrates to account for the administration of the revenue.

At the union of England and Scotland there were seventy royal burghs in Scotland, but four of them were not included in the classes of burghs then formed to send representatives to the British Parliament, and the number was thus reduced to sixty-six. There are now fifty-five royal burghs sending representatives to Parliament, and eleven which do not send representatives to Parliament.

BURGHs of BARONY are corporations analogous to royal burghs, consisting of the inhabitants of certain tracts of ground within the barony erected by the king, and subject to the government of the magistrates, who are elected either by the superior of the barony, or by the inhabitants themselves, according to the terms of the charter of erection.

BURGHs of REALITY were a kind of burghs of barony which had regal or exclusive jurisdiction within their own territory. As hereditary jurisdiction is now abolished, there is now nothing of any practical importance to distinguish this class of burghs from the previous class.

FREE BURGHs were burghs of barony which enjoyed, by crown charter, rights of trade both home and foreign, but which at the same time had to bear certain public burdens as the price of their privileges. These burghs no longer form a distinct class, since there are now no commercial monopolies, and, accord-

ingly, no rights of trade peculiar to any class of burghs.

PARLIAMENTARY BURGHs are such as, not being royal burghs, send representatives to Parliament under the provisions of the Reform Acts 1 and 2 Will. IV. cap. lxx., and 31 and 32 Vict. cap. xlviii. There are fifteen of these, namely, Aldridge, Cromarty, Falkirk, Galashiels, Greenock, Hamilton, Hawick, Kilmarnock, Leith, Musselburgh, Oban, Paisley, Peterhead, Port-Glasgow, and Portobello. The mode of election of councillors and magistrates of parliamentary burghs is the same as in royal burghs. The clause of the Municipal Elections Act of 1868, referring to the division into wards of such burghs as had more than 10,000 inhabitants at the census of 1861, applies to parliamentary as well as to royal burghs.

POLICE BURGHs. In the act for regulating the police of towns and populous places in Scotland (13 and 14 Vict. cap. xxxiii.) the word 'burgh,' as used in the act, is defined to mean not only royal burgh, but any populous place, the boundaries of which have been ascertained in terms of the act.

BURGHERS. See *SCOTSMEN*.

BURCKMAIR, HANS, a painter and engraver, born at Augsburg in 1474, is supposed to have been a pupil of Albert Dürer. Several of his frescoes and paintings in oil upon wood are still preserved in his native town; but though possessed of considerable merit, they have contributed far less to his fame than his woodcuts, in which he at least equalled Dürer, and has scarcely been surpassed by Holbein. He is supposed to have died in 1559.

BURGLARY (derived from the French *burry*, a town, and old French *larron* (modern *larron*), a thief, from the Latin *latro*) is defined to be a breaking and entering the dwelling-house of another, in the night, with intent to commit some felony within the same, whether such felonious intent be executed or not. This is the modern signification of the term, which formerly applied also to the breaking into a church, fort, or town; and the breaking into a church is said, by Sir Edward Coke (3 Inst. 64), to be, undoubtedly, burglary. Both breaking and entering are considered necessary to constitute the offence. The opening a door or window, picking a lock, or unlocking it with a key, raising a latch, or loosing any fastenings, constitutes a *breaking*. Likewise, knocking at the door, and, on its being opened, rushing in, has been so considered. So, if a lodger in the same house open and enter another's room; or if a servant conspire with a robber and let him into the house, it will be such a breaking of a house as, if done with intent to commit a felony, will be burglary. The breaking and entering must, however, be in the night, to make it burglary. At one time lawyers differed much as to the precise meaning of the term *night*, but all doubt on this subject has been removed by statutes 7 Will. IV., and 24 and 25 Vict. cap. xvi. s. 1, which fixes the duration of night from 9 o'clock p.m. to 6 o'clock a.m. The breaking open of a barn, shop, shed, or other building is not burglary, unless it be adjacent to a dwelling-house. A chamber in a college, or in the London inns of court, is, for this purpose, considered to be a dwelling-house. The statute 7 and 8 Geo. IV. cap. xxix., made the punishment death; and this statute, pursuing that of 12 Anne cap. vii., made the committing a felony in a house, and breaking out of it by night, burglary. This statute of Geo. IV. also altered the definition of the crime, by substituting *dwelling for mansion house*. It also defined what should be considered as part of the house, saying, that no building within the same curtilage, and occupied with the dwelling-house, should be deemed a part of it for this purpose, 'unless there

shall be a communication' with the house, 'by means of a covered and inclosed passage'. This provision cleared up a doubt that had hung over the former law. Burglary is punishable by penal servitude for life, or for any period not less than five years, or by imprisonment.

BURGOMASTER, the name of the chief magistrates of the large towns in the Netherlands and Germany, equivalent to the English mayor.

BURGOS, a city of northern Spain, the capital of the prov. of Burgos, and formerly of Old Castile, and once the residence of its kings. It stands on the declivity of a hill, on the right bank of the Arlanzón. The streets are narrow and dark, the finest in every respect being that called the Huerto del Rey. Places of promenade are numerous; the one most frequented, and justly forming the boast of the town, being the Espolón. The most remarkable structure is the cathedral, one of the finest buildings of the kind, not only in Spain, but in Europe. It was commenced in 1221, but was not finished for several centuries. It is built of white marble in the form of a Latin cross, and is about 800 feet long by 200 broad, and its size is such that service can be performed in eight chapels at once without confusion. Its interior as well as its exterior is of great magnificence, is adorned with fine carvings and paintings, and contains numerous monuments, in particular the tombs of Don Fernando and the Cid, both natives of Burgos, and celebrated throughout Spain for their heroic achievements in the wars with the Moors. There are several other fine churches, but the rest of the public buildings are not deserving of notice. The wool of Old Castile passes principally through Burgos, and it has some woollen manufactures. Burgos is the see of an archbishop, and at one time contained a university. Pop. in 1897, 30,856. The province of Burgos is bounded on the N. by Santander, E. by Alava, Logroño, and Soria; S. by Segovia, and W. by Palencia and Valladolid. The area is 5650 square miles, and the pop. in 1897 was 340,001.

BURGOYNE, JOHN, an English general and dramatist. He was the son of an officer, and was born in 1722. He entered early into the army. In 1762 he commanded a force sent into Portugal for the defence of that kingdom against the Spaniards. He also distinguished himself in the American war by the taking of Ticonderoga, but he was at last obliged to surrender with his army to General Gates at Saratoga. On his return to England he was ill received, the disaster to the British arms being laid to his charge. He published some pamphlets in defence of his conduct, and threw up all his appointments. He was afterwards restored to his rank in the army. He is the author of *The Maid of the Oaks*, *Bon Ton*, *The Heiress*, &c., all in the line of what is usually called *genteel comedy*, of which they form light and pleasing specimens. He died June 4, 1792.

BURGOYNE, SIR JOHN FOX, son of the above, an eminent officer of engineers, was born 24th July, 1782. He entered the royal engineers in 1798; served at Malta in 1800, in Sicily with General Stewart in 1808, in Egypt in 1807, and in the Peninsula with Sir John Moore and Wellington from 1809 to 1814. He shared in the celebrated retreat on Corunna, and was present at all the sieges, generally as first or second in command of the engineers, and at most of the battles of the Peninsular war, in which he was twice wounded. In 1815, during the American war, he assisted as lieutenant-colonel and chief engineer in the successful attack on New Orleans. In 1826 he accompanied the army of General Clinton to Portugal in the same capacity. He was appointed chairman of the Board of Public Works in Ireland in 1830,

and in 1845 became inspector-general of fortifications in England. He was made a lieutenant-general in 1851, and on the outbreak of the Crimean war was sent to Turkey to provide for the defence of Constantinople. After returning to England he was again sent out to Sebastopol, where he was chief of the engineering department till recalled in 1855. He received the order of the Medjidie from the Sultan of Turkey, was made a general, and the following year (1858) was created a baronet. In 1868 he was made a field-marshal. At his death, which took place Oct. 7, 1871, he had been for some years Constable of the Tower of London.

BURGUNDY, a region of Western Europe, so called from the Burgundians, a Teutonic people originally from the country between the Oder and the Vistula. They migrated to the region of the Upper Rhine, and in the beginning of the fifth century they passed over into Gaul, and after a long struggle obtained possession of the south-eastern part of this country. Here they founded a kingdom, which had as its seat of government sometimes Lyons, and sometimes Geneva; but having become engaged in a war with the Franks, they were at last wholly subdued in 534. More than one Kingdom of Burgundy, so called, subsequently arose, as well as the important county of Burgundy (Upper Burgundy, Franche-Comté); but the most important state of this name was the DUCHY OF BURGUNDY (Lower Burgundy), consisting principally of the French province Bourgogne (*Burgundy*, properly so called). The long line of ancient Dukes of Burgundy became extinct in 1361 with the death of Duke Philip, and Burgundy was immediately united by King John of France with the French crown. The dignity of Duke of Burgundy was restored in 1363 by his grant of the dukedom to his youngest and favourite son, Philip the Bold. In 1368 he married Margaret, the widow of the last Duke Philip of the old line, only daughter and heiress of Louis III., count of Flanders, and thereby greatly augmented his possessions, which now included Flanders, Mechlin, Antwerp, and Franche-Comté. In 1402 he was made regent of France, an appointment which gained him the hatred of the king's brother Louis, Duke of Orleans, and led to the struggle between the Orleanist and the Burgundian factions. (See PHILIP THE BOLD.) In 1404 Philip died, and was succeeded by his son, John the Fearless, who was stabbed by the companions of the dauphin in 1419. His son and successor, Philip the Good, gained great accessions of territory, including Hainault, Holland, Zealand, Namur, and in 1431 Brabant and Limburg, which reverted to him from a younger branch of his family. In 1441 he also obtained the Duchy of Luxemburg. On his marriage with his third wife, Isabella, daughter of King John of Portugal, he founded the order of the Golden Fleece. (See PHILIP THE GOOD.) His son, Charles the Bold, who succeeded him in 1467, became the inveterate enemy of Louis XI. of France, and one of the most powerful princes in Europe. (See CHARLES THE BOLD.) He acquired Guedres in 1475, but perished in the fatal battle of Nancy in 1477, leaving behind him a daughter, Maria, the sole heiress of his states. She married Maximilian of Austria, who thus obtained the Netherlands and Upper Burgundy. The King of France received the dukedom of Burgundy, which he assumed as a fief. Henceforth the territories that had belonged to Charles shared the fortunes either of France or of the Empire. In the empire what was called the circle of Burgundy for a time embraced Franche-Comté and the Netherlands. In the peace of Madrid, in 1526, Francis I. was obliged to agree to the cession of the duchy

of Burgundy to Charles V. of Germany, but the cession was never carried out, and in the peace of Cambrai, in 1529, Charles renounced his claim to it. Franche-Comté was conquered by Louis XIV., and retained by him at the peace of Nimeguen in 1678. After this the name Burgundy is best known as designating one of the provinces or governments of France. See also AUSTRIA, BELGIUM, FRANCE, &c.

BURGUNDY (called also *Burgundy Proper* or *Lower Burgundy*), formerly a province in the E. of France, lying on the W. of Franche-Comté, and on the S. of Champagne. It now forms the four departments of Yonne, Côte-d'Or, Saône-et-Loire, and Ain. It is one of the most productive regions in France. The principal product is wine. (See **BURGUNDY WINES**.) See also preceding article.

BURGUNDY WINES are produced in the former provinces of Upper and Lower Burgundy (see above), and in richness of flavour and perfume, and all the more delicate qualities of the juice of the grape, they are inferior to none in the world. The finest of the red wines of Burgundy are the Romanée-Conty, the Chambertin (the favourite of Louis XIV. and Napoleon), the Closvogueot, the Richebourg, the Romanée de St. Vivant, &c. The white wines are less numerous but not inferior in aroma and flavour.

BURHANPORE (more correctly **BURHANPUR**). See **BOORHANPOOR**.

BURIAL, the mode of disposing of the dead, a practice which varies amongst different peoples. Among savage races, and even among some cultured peoples of the East (as the Parsees), exposure to wild animals or birds of prey is not uncommon. The careful embalming of the dead by the ancient Egyptians may be regarded as a special form of burial. But by far the most common forms of disposing of the dead have been burning and interring. Amongst the Greeks and Romans both forms were practised, though amongst the latter burning became common only in the later times of the republic. In this form of burial the corpse, after being borne in procession through the streets, was placed upon a pyre built of wood, and profusely sprinkled with oils and perfumes. Fire was set to the wood, and after the process of cremation was complete the bones and ashes were carefully gathered together by the relatives and placed in an urn. With the introduction of the Christian religion, consecrated places were appropriated for the purpose of general burial, and the Roman custom of providing the sepulchre with a stone and inscription was continued by the Christians. The practice of cremation now declined and finally disappeared, but has recently to some extent been revived. (See **CREMATION**.) In England every person has a right to be buried in the churchyard of the parish where he dies, and by the **Burial Laws Amendment Act, 1880**, it is provided that after forty-eight hours' notice to the incumbent or his substitute, such burial may take place either with the service of any Christian church or without any service. See **BURYING-PLACES**, **FUNERAL RITES**, **MAUSOLEUM**, **MUMMIES**, **TUMULI**, &c.

BURIATS, a nomadic Tartar people who submitted to the Russians in 1644, and form a branch of the Kalmuoka. They inhabit the southern part of the government of Irkutsk and Transbaikalia, and number from 150,000 to 200,000. They support themselves by their flocks, by hunting, and the mechanical arts, particularly the forging of iron. Their dress consists partly of leather. Their religion is partly Lamaism and partly Shamanism; and their idols are sometimes painted on cloth, and sometimes made of wood, metal, felt, and sheepskin.

BURIDAN, JEAN, a scholastic philosopher of the fourteenth century, born at Béthune, in the county of

Artois; studied at Paris, where he attached himself as a disciple of Occam to the party of the Nominalists, and at a later time became himself a teacher. In the end he was forced by his opponents to flee from Paris, when he betook himself to Vienna, where he is said to have been influential in bringing about the establishment of the university of that town. Here also he wrote some logical and ethical treatises, in which he appears as a zealous adherent of the Aristotelian philosophy. Buridan was a supporter of the doctrine of Determinism, and he is now chiefly known through having his name attached to an illustration that he is said to have used in support of his views, and known as 'Buridan's Ass'. He is said to have supposed the case of a hungry ass placed at an equal distance from two equally attractive bundles of hay, and to have asserted that in the supposed case the ass must inevitably perish from hunger, there being nothing to determine him to prefer the one bundle to the other. This illustration, however, is not found in any of his works, and from its nature it would appear more likely to have been used by the assailants of the doctrine of Determinism. Buridan died after 1358, at the age of sixty.

BURIN, or **CHAUVER**. See **ENGRAVING**.

BURKE, EDMUND, a writer, orator, and statesman of great eminence, was born in Dublin, probably on Jan. 12th, 1729. His father was an attorney of reputation, and he received his education under Abraham Shackleton, a Quaker, at Ballitore. In 1743 he was entered at Trinity College, Dublin, as pensioner, where he chiefly occupied himself with a plan of study of his own, the principal objects of which were the classics, logic, metaphysics, morals, history, rhetoric, and composition. He left Trinity College, after taking a bachelor's degree, in 1748; and not much is recorded of his life for the next few years. In 1750 he first entered the great theatre of London as a law student at the Middle Temple, but he did not study with assiduity and was never called to the bar. He is said to have become the admiration of his intimates, however, for the brilliancy of his parts, and the variety of his acquisitions. Applying himself to literature, he supported himself by his pen, and by intense occupation brought himself into a state of ill-health. This illness, by making him a guest of Dr. Nugent, an eminent physician, led to his marriage with that gentleman's daughter. In 1756 he published, without a name, his first work, entitled *A Vindication of Natural Society*, in a Letter to Lord —, by a late Noble Writer. This work exhibited so complete an imitation, although ironical, of the style of Bolingbroke, that many persons were deceived by it, not perceiving Burke's intention to prove that the same arguments with which that nobleman had attacked religion might be applied against all civil and political institutions whatever. In the same year he published his *Philosophical Inquiry into the Origin of our Ideas of the Sublime and Beautiful*. The elegance of its language, and the spirit of philosophical investigation displayed in it, introduced the author to the best literary acquaintances. In 1758 he suggested to Dodley the plan of the *Annual Register*, and took upon himself the composition of the historical part, which he continued for a number of years. He was thus gradually forming himself for a statesman. His political career may be said to have commenced in 1761, when he went to Ireland as confidential friend to William Gerard Hamilton, then secretary to the lord-lieutenant, Lord Halifax. In 1763 Hamilton obtained for him a pension of £300 per annum on the Irish establishment, but the conduct of his patron soon led him to throw it up. On his return to London he joined the club to which Dr. Johnson,

Garrick, and Reynolds belonged, all of whom became his intimate friends. In 1765, he was introduced to the Marquis of Rockingham, then first lord of the treasury, who made him his private secretary; and through the same interest he entered Parliament as member for Wendover. The marquis also made him a nominal loan, but real gift, of a large sum, which, together with funds otherwise obtained, placed him for a time in easy circumstances, and enabled him to purchase his elegant seat near Beaconsfield. His first speech in Parliament was on the Grenville Stamp Act; and it was at his advice that the Rockingham administration took the middle and undecided course of repealing the act, and passing a law declaratory of the right of Great Britain to tax the American Colonies. This ministry was soon dissolved, to make room for a new cabinet, under Pitt. Burke concluded his official labours by his pamphlet entitled *A Short History of a Short Administration* (1766). In the proceedings against Wilkes he joined the remonstrants against the violation of the rights of election, and in 1770 published his *Thoughts on the Causes of the present Discontents*, the sentiments of which are consistent with his future doctrines and conduct. He opposed the ministerial measures antecedent and consequent to the American war; and the whole powers of his eloquence were exerted, first to prevent, and then to heal the fatal breach between the mother country and her colonies. In 1774 he was chosen member for Bristol, and for the next eight years Fox warmly supported him in his opposition to Lord North's administration. In 1778 he delivered his famous speech against the employment of the Indians in the American war. He subsequently ventured to give offence to his Bristol friends, by his support of the Irish petitions for free trade, and for moderating the penal statutes against the Roman Catholics. In 1780 he introduced his famous economical reform bill, which he unsuccessfully advocated with an extraordinary union of wit, humour, and financial detail. Next year, being now member for Malton, he again brought it forward without success. In 1783 Lord North's ministry was dissolved; and on the return of the Marquis of Rockingham and his party to power, Burke obtained the lucrative post of paymaster-general of the forces, and a seat at the council board. He also embraced the auspicious opportunity to reintroduce his reform bill, which passed, but not without considerable modifications. On the death of the Marquis of Rockingham, and the succession of Lord Shelburne, Burke resigned, and joined the coalition. The India Bill formed the ostensible cause for dismissing this ill-judged combination; and Pitt succeeded to the helm, his administration lasting for seventeen years. The next great political event in Burke's life was his share in the prosecution of Warren Hastings, which trial, indeed, originated with him. His conduct in this affair gained him little in the public estimation, except increased fame as an orator. On the settling of the regency in 1788 he argued against the principle of the ministers, that the regency was elective, and not hereditary. The last great act of his political life was the part he took in the discussions on the French revolution. He early manifested his dislike to it, and in 1790 loudly condemned the principles and conduct of the revolutionists. It was mainly this feeling that made him oppose Fox's bill for the repeal of the Test and Corporation Acts (March, 1790). His famous *Reflections on the Revolution in France* appeared in November of that year; and no work ever attracted more attention, or produced more effect. It exhibits both the merits and defects of the writer, and contains much just-

ness of argument, profundity of observation, and beauty of style; but it is equally obvious that he commits the very fault which he intended to reprobate in his *Vindication of Natural Society*, by making his arguments applicable to the defence of all establishments, however tyrannical, and censure of every popular struggle for liberty, whatever the oppression. It had an unprecedented sale, and obtained unbounded praise from all who trembled for establishments, or were alarmed at the odious character which the French revolution was beginning to assume. On the other hand, it met with severe and formidable critics and opponents, and, among other things, produced the celebrated *Rights of Man*, of Thomas Paine, and the *Vindiciæ Gallicæ*, of Sir James Mackintosh. Burke followed up this attack with a Letter to a Member of the National Assembly (1791); an Appeal from the New to the Old Whigs (1791); Letter to a Noble Lord on the Subject in Discussion with the Duke of Bedford (1796); Letters on a Regicide Peace (1796-97); &c. In all these productions he displayed unabated powers of mind. In 1792 he published a Letter to Sir Hercules Langrishe, on the Propriety of admitting Roman Catholics to the Elective Franchise. In 1794, after a nine days' speech against Warren Hastings, he withdrew from Parliament, and was succeeded in the representation of Malton by his only son, whose death soon after hastened the decline of nature which he was beginning to experience. Decay, by gradual approaches, terminated his life on July 9, 1797, in the sixty-eighth year of his age. He preserved his senses to the last; and a few hours before he died he had read to him Addison's paper in the Spectator, on the immortality of the soul. Amiable in private life, and exemplary in his domestic and social relations, he was greatly beloved by his friends. His conversation was delightful and instructive. He was exceedingly charitable and beneficent, and founded a school for the children of French emigrants, the permanent support of which formed one of his latest cares. His public character will be best collected from a study of his political career, and his powers of mind from his publications. His oratory was pre-eminently that of a full mind, which makes excursions to a vast variety of subjects, connected by the slightest and most evanescent associations, and that in a diction as rich and varied as the matter. In delivery, however, the effect of his speeches was by no means proportioned to their absolute merit; their length, their copiousness, abundance of ornament, and wide field of speculation, producing impatience in men of business absorbed in the particular subject of debate; added to which, his manner was indifferent, his voice harsh, and his action, though forcible, inelegant. On the whole, though the greatest genius, he was by no means the most effective orator in the House of Commons. A handy edition of his works is that of Bohn, eight vols., with life by Sir James Prior in one: see also Macneil's *Life and Times of Edmund Burke* (three vols. 1858-60); Morley's volume on Burke in *English Men of Letters*; and his Burke, a Historical Study.

BURKE AND HARE, two miscreants, of whom William Burke, a native of Ireland, was detected, tried, and executed at Edinburgh, in 1828-29, for the murder of numerous individuals, his accomplice Hare escaping the hangman by turning king's evidence. At this time the 'resurrectionists' were busy at their nefarious trade, but the vigilance with which the burying-grounds throughout the country were watched rendered a supply of subjects for anatomical schools almost impracticable, and the demand for dead bodies consequently became great. This led Burke and Hare to murder, by suffocation, many poor wails who were decoyed into Hare's lodging-

house, and whose bodies they sold to Dr. Robert Knox, proprietor of an anatomical theatre in Edinburgh. The case of Burke and Hare brought home to the public mind more clearly than ever how necessary it is that schools of anatomy should receive a regular supply of subjects for dissection, and in 1832 an act was passed for supplying the anatomical schools throughout the kingdom from the unclaimed dead in the hospitals. See ANATOMY.

BURLEIGH, LORD. See CROIX.

BURLESQUE, the comic effect arising from a ludicrous mixture of things high and low. High thoughts, for instance, are clothed in low expressions, or noble subjects described in a familiar manner, or *vice versa*. The burlesque style, which always partakes of the nature of caricature, may be adopted simply to excite laughter, or to provoke derision and ridicule. The term is often applied to a theatrical piece, which may be described as a dramatic extravaganza with more or less singing in it.

BURLINGTON, a town in England. See BRIDLINGTON.

BURLINGTON, a city in Vermont, United States, and capital of Chittenden county, situated on a bay to which it gives name, on the s. side of the entrance of Onion River into Lake Champlain, 100 miles s. of Montreal. Burlington is the most considerable commercial town in Vermont. Its trade is principally with the city of New York, with which it has a water communication by means of Lake Champlain, the Champlain Canal, and the river Hudson. The University of Vermont was incorporated and established at Burlington in 1791, but it did not come into operation till 1800. It is finely situated on the n. side of the town, 1 mile distant from Lake Champlain, on elevated ground commanding an extensive and delightful prospect. The university possesses considerable endowments; but the number of students has never been large. Since 1872 women have been admitted to the classical and scientific courses. Pop. in 1890, 14,590.

BURMA, or **BURMAH**, a province of British India, on the east side of the Bay of Bengal, bounded on the east by Siam, the Laos territory, and China, and on the north and north-west chiefly by Assam and other parts of India. At one time it formed the greater portion of a native kingdom or empire, which is said to have extended from 9° to 26° n. lat., and from 92° to 104° e. lon., its greatest length being about 1000 miles, and its breadth 600; its area being then about 270,000 English square miles. But in 1826 the provinces or divisions of Arracan and Tenasserim were wrested from it by the British, and in 1852 Pegu and the province of Martaban shared the same fate. This portion was then known as British Burma, and continued to be so till in 1886 the rest of the kingdom was annexed by Britain, when the two portions came now to be designated Upper and Lower Burma respectively. They now form together one province, which is under a lieutenant-governor and legislative council. The area of Lower Burma is 87,957 square miles. It is to a large extent mountainous in character, the only extensive level being in Pegu, where the valleys of the Irrawadi and Sittaung form an alluvial tract of about 10,000 square miles. The rainfall varies from less than 60 inches in some places to 190 or more in others. About half the soil is believed to be cultivable, but a comparatively small portion is as yet under cultivation, though agriculture is extending year by year. Since the occupation of the country by the British it has rapidly increased in prosperity, and the revenue is generally greater than the expenditure. The imports and exports together exceed £10,000,000, the bulk of the trade being with Britain. The capital and

principal port is Rangoon. Others are Moulmein, Akyah, and Bassein. Pop. in 1881, 3,786,771; in 1891, 4,658,627; in 1901, 5,871,928. Upper Burma has an area of 83,478 square miles; pop. (1891), 2,046,933; (1901), 3,849,833. It is on the whole similar in character to Lower Burma, but is less productive, and has generally a smaller rainfall. It is rich in minerals, including gold, silver, precious stones, marble, iron, lead, tin, antimony, arsenic, sulphur, and petroleum. Only a few of these are worked. The chief precious stones are the ruby and the sapphire; amber and jade are also found. All precious stones used to be sent to the royal treasury, and strangers were prohibited from approaching the places where they were found. These districts are still the subject of special regulation under the British rule. The whole country is intersected by numerous streams, which, following the direction of the chief mountain chains, flow generally southwards to the Indian Ocean. The chief of these are the Irrawadi, the Salween, and the Chindwin, which joins the Irrawadi, the combined stream being of great volume. The Irrawadi is of great value as a highway of communication and traffic, being navigable beyond Bhamo, near the Chinese frontier. In their upper courses the rivers flow through narrow valleys; in their lower courses they traverse low-lying districts, and in the rainy season often overflow their banks. Among the wild animals of the country are the elephant, rhinoceros, tiger, leopard, deer of various kinds, and the wild hog. The rivers abound with fish. Of domestic animals we may mention the ox, buffalo, horse, elephant, and cat. In the southern districts, owing to the numerous rivers, the soil is most productive. Here grow rice, sugar-cane, tobacco, cotton, indigo, and all the tropical fruits. Tea is cultivated in many of the more elevated parts. The forests produce timber of many sorts, including teak. A great part of the trade of the country is carried on by means of the river Irrawadi. From Bhamo goods are conveyed to China, and this branch of trade is believed to be capable of great development. Rice is the great crop (occupying about 80 per cent of the cultivated area), and this grain forms the chief export, others being teak, cotton and silk stuffs, petroleum, saltpetre, paper, and lacquer ware. Railways have been introduced, and the number of miles open is now about 1000. From Rangoon two lines proceed northwards, one along the left bank of the Irrawadi to Frome and Meadway, the other through the Sittaung valley to Mandalay, and from that on the other side of the Irrawadi to Bhamo and Mogaung. A continuation of the latter to Myitkyina is in progress, as also a branch from Mandalay to the Kun-long Ferry, on the Salween, as a trade route to the Chinese province of Yunnan. The Burmese are skilful weavers, smiths, sculptors, workers in gold and silver, joiners, &c. Among industrial establishments are rice-mills, saw-mills, a few works for iron goods, ship-building yards, cutch works, &c. Other industries include boat-building, weaving, pottery, lacquer-work, and brass-work. The weaving of cotton and silk goods is carried on by the women everywhere. The pottery of the country is strong and durable, if not specially artistic; and the gold and silver work finds numerous purchasers outside the country. Wood-carving is extensively practised for the adornment of houses, boats, &c. The native vessels plying on the Irrawadi and other rivers are often of 100 to 150 tons burden, while thousands of small craft are engaged in trade or fishing. Large numbers of good cigars are made by women, and are partly used in the country, partly exported. The buildings among the Burmese are very slight, as the government used to require them to be chiefly of wood or bamboo, and prohibited

the use of stone or brick except for pagodas, and other important structures.

The Burmese are divided into several tribes, and belong to the common Indo-Chinese stock. Among the tribes other than the Burmese proper are the Karens, Kachyens, Shans, &c. The Burmese proper are of a brown colour, with lank, black hair, and vigorous, well-proportioned frames. No Burmese can have more than one wife; but he may have as many mistresses as he will. The latter live in the same house with the wife, and are her servants. The Burmese women enjoy a good deal of freedom; they are not shut up as in some parts of the East, and can even engage in a lawsuit in their own name. The chief amusement of the Burmese is their theatre, where declamation, dancing, and music are given by turns. The new year (which begins in April) is celebrated with what is known as the 'water feast', when young men and women throw water on each other and the passers-by. The Burmese usually write on palm leaves with an iron style or on black tablets with a penoil; the rich have libraries, with books the leaves of some of which are thin pieces of ivory, with gilt edges. Their materia medica is chiefly confined to herbs, spices, and mercury; with vaccination they have long been acquainted. The language is monosyllabic, like Chinese, and written with an alphabet (derived from India), the characters of which are more or less circular. Among the common people the principal part of the male dress consists of a double piece of cloth about 5 yards long, loosely wrapped about the body. Over this a frock is worn, with sleeves open in front, and reaching below the knees. The lower classes of women wear only a single garment, resembling a sheet, wrapped round the body and fastened under the arms. Men of rank wear a long robe of flowered velvet or satin, with open sleeves and collar, a mantle or scarf being thrown over this. On the head is worn a high velvet or silk cap, plain or embroidered, according to rank. The men wear ear-rings, often of large size. Women of the higher classes generally wear a shift which reaches only to the pit of the stomach, where it is drawn tight and fastened by strings. This is covered by a loose jacket, with tight sleeves. A piece of silk or cloth encircles the waist and descends to the feet. When a woman wishes to be particularly fine she stains her nails and palms of a red colour, and tinges her teeth and the edges of her eyelids with black. Both sexes wear the hair long; the men tying it in a knot on the crown of the head, the women on the back. Sandals are often worn, but neither boots, shoes, nor stockings; every man, woman, and child, however, carries an umbrella. The chewing of betel and smoking of tobacco are universal. The Kachyens or Singfo are a courageous people inhabiting the upper basin of the Irrawadi above Bhamo. They practise a sort of nature-worship, and are active as traders, though at present rather lawless. Their villages are ruled by hereditary chiefs. The Chinese from Yunnan have of late years settled in considerable numbers as traders and agriculturists in the Kachyen country; and in Lower Burma they are now a highly important element in the population as traders and otherwise. In the hilly districts of Tenasserim and Pegu we find the Karens, a somewhat secluded people, less intelligent and more ignorant than the Burmese, and not so purely Mongolian in physical character. The Talaings or Mons of the Irrawadi delta resemble the Burmese, but speak a distinct language. The Shans are a numerous people closely allied to the Siamese, and inhabiting Eastern and North-eastern Burma, together with portions of the neighbouring countries.

The native government was an absolute monarchy, the king having unlimited power over life and property. The seat of government, after oscillating between Ava and Amarapura, was latterly fixed in Mandalay, a new town founded in 1857, and situated in a dusty plain a little over two miles from the left bank of the Irrawadi, and about 28 miles S.W. from Amarapura. The king was assisted in governing by a council of state known as the *Hlood-daw*, to which belonged at once the functions of a legislature, a cabinet, and a supreme court of justice. It was composed of officials of fourteen grades, the president being the king himself, some other member of the royal family, or the prime minister. The king had power to punish at his pleasure anyone, including even the great officers of state. The public revenue was derived from taxes levied in a very irregular and capricious manner, and as the officials received no fixed salary corruption and oppression were extremely prevalent. The criminal laws were barbarously severe. Capital punishment was commonly inflicted by decapitation, but crucifixion and disembowelling were also practised. Torture might be applied to principals or witnesses; and trial by ordeal was not unknown. The standing army was small. Levies were made, in case of war, by way of conscription; and a specified number of houses was required to furnish a soldier or pay a fine.

The religion of the country is that of Buddha, which is said to exist here in great purity. The tutelary divinities worshipped in various Buddhist countries are unknown, and the vows of poverty and chastity taken by the monks are said to be less frequently broken here than elsewhere. The Burmese possess a complete system of education, so far as male children are concerned. All boys are required to reside in a religious house for three years, and there they act as servants to the priests, who instruct them in reading, writing, and arithmetic, as well as the doctrines of their religion.

The Burmese Empire is of little note in ancient or general history. Buddhism and civilization are said to have been introduced from India. The last native dynasty was founded by a Burmese called Alompra, a man of obscure birth, who defeated the Peguans, and in 1753 obtained possession of Ava. Having made himself master of Burma, he invaded Siam; but, during this invasion he died suddenly in 1760. Alompra ruled well and wisely, and Nandogee, his eldest son and successor, who died in 1764, inheriting his father's spirit, introduced various reforms and useful measures. Shembuan (Tshen-bo-yen), the emperor's brother, became regent as guardian for his nephew Momiin; but he usurped the throne himself and conquered Siam. In 1771, however, Siam recovered its independence, while the principal part of the Burmese forces were engaged in a war with China. In this war they were victorious, and compelled the Chinese whom they took prisoners to intermarry with Burmese females, and to remain in their territory. In 1776 Shembuan left his empire, much enlarged, to his son Chenguza. This prince lived in the unrestrained indulgence of every appetite till, in 1782, he was dethroned and put to death. In consequence of the revolution, Mentaragyi, the fourth son of Alompra, ascended the throne. He ordered his nephew Momiin, who was a state prisoner, to be drowned, and in 1783 subdued the kingdom of Arracan. He then engaged in a war with Siam, which continued till 1793, when peace was made on certain conditions. About this period some robbers fled from the Burmese Empire, and took refuge in the territory of the East India Company. The Burmese demanded that they should be delivered up, and on their demands not

being immediately complied with, marched with a strong force into the offending country. At the same time they carried on a friendly negotiation with the government in Calcutta, which resulted in the surrender of the criminals, and the conclusion of a treaty of amity and commerce between the two governments, negotiated by Captain Symes. The last victory of the Burmese was in 1822 over the province of Assam. The party driven from Assam, together with Burmese rebels, fled to the British territories, whence they intended to invade Burma. The British government disarmed the insurgents, but refused to deliver them up or to drive them from the island of Shapuri, which they had occupied. At length the Burmese sovereign demanded of the government at Calcutta the cession of Northern Bengal as being a part of Ava, and in January, 1824, his forces marched into Cachar, which was under British protection. Lord Amherst, as governor-general of the British East Indies, now declared war against Burma, and General Archibald Campbell prosecuted it so successfully that, after the victory at Prome (Dec. 1-3, 1825), he obliged the monarch to conclude a peace at Palanah in 1825. As the treaty was not ratified on the part of the Burmese emperor by the time specified (Jan. 18, 1826), Campbell renewed the war, and stormed the fortress of Munnun. On Feb. 24 the peace was ratified, and the war concluded with the cession of Arracan, Mergui, Tavoy, &c. In 1852 a second war broke out, at the conclusion of which Rangoon and the whole of Pegu fell into the hands of the British. About 1860 the new city Mandalay supplanted Amarapura as the capital. In 1867 British steamers were permitted by treaty to navigate Burmese rivers, and not long after traffic was carried on up the Irrawadi as far as Bhamo. In 1885 the outrageous proceedings of King Theebaw provoked another war, and a British force proceeded from Rangoon up the river Irrawadi, took Mandalay, and sent King Theebaw a prisoner to Rangoon. On 1st January, 1886, Theebaw's dominions were annexed to the British Empire by proclamation of the Viceroy of India (the Earl of Dufferin). After the annexation there was a considerable amount of scattered fighting with dacoits and others, but the country is now comparatively quiet, is being opened up to commerce, and is rapidly advancing in prosperity. In 1897 Burma was constituted a province, and placed under a lieutenant-governor instead of a chief-commissioner.

BURNES, SIR ALEXANDER, a distant relation of Robert Burns, was born at Montrose in 1805, studied at the academy there, and having obtained a cadetship, joined the Bombay native infantry in 1821. Here his proficiency in Hindustani and Persian procured him two regimental appointments as interpreter, and contributed greatly to his future promotion. In 1829 he was appointed to assist the political agent in Cutch in prosecuting the survey of the N.W. frontier, and in 1830 he was appointed to proceed to Lahore, ostensibly for the purpose of delivering a present of horses from the King of England to Runjeet Singh, but really for the purpose of acquainting himself with the lower Indus, with the view of opening it up to commercial enterprise. On returning from this mission, which he successfully accomplished, he proposed a mission into Central Asia, and having obtained the sanction of the government, set out in January, 1832, descended the Sutlej to Lahore, and proceeded thereafter to Peshawar, Cabul, and Bokhara. He afterwards travelled with a caravan across the desert of Merv, visited the Shah of Persia in his capital of Teheran, travelled southwards to the Persian Gulf, and reached Bombay

after a year's absence. He published an account of this journey in 1834, under the title of *Travels into Bokhara, &c.* He was afterwards sent to England as the bearer of his own despatches, received the special thanks of the court of directors, and was presented with the gold medal of the Royal and the silver medal of the French Geographical Society. He returned to India in 1835, and in the following year Lord Auckland sent him on a commercial mission to Cabul. Whilst there he discovered that Russia was intriguing to detach the emir, Dost Mohammed, from the British alliance, and on finding the emir disposed to be friendly to Britain, he urged Lord Auckland to come to terms with him. His advice was, however, rejected, and a force was dispatched in 1839 to reinstate Shah Sujah on the throne. Burnes accompanied the force as second political officer, and received the honour of knighthood. On November 2nd, 1841, on the breaking out of an insurrection in Cabul, he was murdered along with his brother and several other Europeans. An account of his journey to Cabul and residence in it was published in 1842.

BURNET, the popular name of two genera of plants, both of which belong to the natural order Sanguisorbaceae of Lindley, which forms the sub-order Sanguisorbeae, of the natural order Rosaceae, with most other botanists.—1. COMMON or LESSER BURNET (*Pulterium sanguisorba*), a perennial plant which grows to the height of about 2 feet; leaves smooth, alternate, imparipinnate, composed of serrate leaflets; flowers arranged in rounded heads of a purplish colour, with the female flowers above and the male flowers below. It is found in sunny places in the middle and s. of Europe, and also in England, especially in the chalk districts. It is cultivated in kitchen gardens for its aromatic leaves, which are used to season salads. It is also an excellent food for cattle.—2. GREATER BURNET (*Sanguisorba officinalis*), also a perennial plant with imparipinnate leaves; calyx in four divisions; corolla wanting; stamens, four. Its stem is straight, from 2 to 3 feet in height; leaflets ovate, smooth; flowers red, arranged on oval spikes at the extremity of long peduncles. This plant grows chiefly in dry meadows, and is found in some parts of England. Its habits are the same as those of the lesser burnet, but its perfume is less agreeable, and it is less astringent. It forms a very wholesome food for cattle, although its hard stalks sometimes cause them to refuse it.

BURNET, GILBERT, a celebrated prolate and historian, was born at Edinburgh on Sept. 18th, 1643, his father being an advocate who was made a lord of session at the Restoration. Having graduated in arts at Marischal College, Aberdeen, he zealously devoted himself to the study of law and divinity. In 1661 he qualified as a probationer in the church, and two years later visited England, where he made the acquaintance of many eminent men. He travelled into Holland in 1664, and on his return he was made fellow of the Royal Society in London, and ordained to the living of Saltoun, Haddingtonshire, in 1665. In 1669 he was made a professor of divinity at Glasgow, where he published his *Modest and Free Conference between a Conformist and a Nonconformist*, and wrote his *Memoirs of the Duke of Hamilton* (1678); and was offered a Scottish bishopric, which he refused. His *Vindication of the Authority, Constitution, and Laws of the Church and State of Scotland*, in which he maintains the cause of Episcopacy, was much approved of at court, and several bishoprics were successively offered him and refused. In 1678 he was made chaplain in ordinary to the king, and was in high credit both with Charles and the Duke of York. In consequence of

the machinations in favour of Popery, he inclined to the opposition party in the Scottish Parliament, and afterwards removed to London, where he was coldly received by the king, and struck out of his list of court chaplains. He, however, received the appointment of chaplain to the Rolls Chapel in 1676, and shortly afterwards the lectureship at St. Clement's. The nation being alarmed on account of the progress of Popery, Burnet undertook a History of the Reformation in England. He gave a first volume to the public in 1679, when the affair of the Popish Plot was in agitation. It procured for the author the unprecedented honour of thanks from both houses of Parliament. The second volume appeared in 1681; the third, which was supplementary, in 1714. The high character of Burnet as a divine caused him to be sent for by the witty and profligate Earl of Rochester, when, exhausted by a course of libertinism, he was sinking into the grave, at the early age of thirty-three. The result of his conferences with the dying nobleman he gave to the world in his celebrated Account of the Life and Death of the Earl of Rochester. About this time he wrote a letter to the king censuring his public misgovernment and private vices. His connection with the opposition party was now very intimate, and he attended Lord William Russell to the scaffold, when executed for his share in the Rye House plot. He published during this period several works in favour of liberty and Protestantism, and wrote the lives of Bishop Bedell and Sir Matthew Hale (1682); and in 1683 he made his translation of More's Utopia. He travelled in France in 1683, and was received by many of the most distinguished men of that country. Shortly after his return he was dismissed from the Rolls chaplaincy and the St. Clement's lectureship. On the accession of James he made a tour in France and Italy, and in 1687 he published an account of his travels in a series of letters to Robert Boyle. When at Utrecht he was invited to the Hague by the Prince and Princess of Orange, and had a great share in the councils relative to Britain. James caused a prosecution for high treason to be commenced against him in Scotland, and demanded his person from the States, who refused to deliver him up. In the Revolution he took an active part, accompanying the Prince of Orange to England as chaplain, and was rewarded for his services by the bishopric of Salisbury. On taking his seat in the House of Lords, he displayed his usual moderation in regard to the non-juring clergy and dissenters. As a prelate Bishop Burnet distinguished himself by fervour, assiduity, tolerance, and charity. In 1699 he published his Exposition of the Thirty-nine Articles. The scheme for the augmentation of poor livings out of the first-fruits and tenths due to the crown, known as Queen Anne's Bounty, originated with Burnet. He died on March, 7th, 1715, in the seventy-second year of his age. He left behind him in manuscript his well-known History of his Own Times (two vols. fol. 1723-34), to which his son, Sir Thomas Burnet, judge of the court of common pleas, on publishing it prefixed a life.

BURNET, THOMAS, a learned divine and philosopher, was born at Croft, in Yorkshire, about 1655, educated under Dr. Ralph Oudworth at Cambridge, and afterwards travelled as tutor to several young noblemen. In 1680 he made himself known by his *Telluris Theoria Sacra*, which he subsequently translated into English. In 1685 he became master of the Charter-house, and after the Revolution of 1688, he was appointed chaplain in ordinary and clerk of the closet to King William. In 1692 he published his *Archæologia Philosophica, sive Doctrina antiqua de Rerum Originibus*. The freedom of opinion dis-

played in this work led to the removal of the author from the clerkship of the royal closet. He died on September 27th, 1715, and was interred in the Charter-house Chapel. Two posthumous works of this author appeared in 1727—a *Treatise De Fide et Officiis Christianorum*; and another, *De Statu Mortuorum et Resurgentium*. All the works of Burnet exhibit him as an ingenious speculator, rather than as a patient and sober inquirer concerning the moral and natural phenomena of which he treats. His great work, the *Theory of the Earth*, is one of the many systems of cosmogony in which Christian philosophers have attempted to reconcile the Mosaic account of the creation, paradise, and the deluge, with the traditions of the ancients and the principles of modern science. His speculations are recommended by sublimity of description and eloquence of style. In his *Archæologia Philosophica*, the doctor has combated the literal interpretation of the history of the fall of man; and to expose its improbability he has introduced an imaginary dialogue between Eve and the serpent, which, as coming from the pen of a divine, is singular enough. It is only to be found in the first edition of the work.

BURNETT, JAMES, better known by his official title of Lord Monboddo, as a judge of the Court of Session in Scotland, was born in 1714, at the family seat of Monboddo, in Kincardineshire. After studying at Aberdeen and Edinburgh he went to the University of Groningen, whence he returned in 1737, and commenced practice as an advocate at the Scottish bar. In 1767 he was raised to the bench on the decease of his relative, Lord Milton. He distinguished himself by his writings as a metaphysician, having published a work on the Origin and Progress of Language (1773-92, six vols.), and *Ancient Metaphysics* (1779-99, six vols.). Lord Monboddo was an enthusiastic admirer of ancient literature, and especially of the works of Plato and other Grecian philosophers. His works contain many interesting observations, but also exhibit some strange and paradoxical opinions. Thus he seriously advocates the existence of satyrs and mermaids, and has advanced some whimsical speculations relative to the affinity between the human race and the monkey tribe, which exposed him to a good deal of ridicule on the first publication of his theories. Both his official and his private character were extremely respectable; and he was, notwithstanding some eccentricities, a man of learning and ability. He died at Edinburgh, May 26, 1799.

BURNLEY, CHARLES, an eminent composer and writer on music, was born at Shrewsbury on April 12th, 1726, and educated at Chester. He studied music under the organist of the cathedral there, and at Shrewsbury, under the direction of his half-brother, an organist, and latterly in London between 1744 and 1747, under Dr. Arne. In 1751, his health having broken down, he obtained the place of organist at Lynn Regis, in Norfolk. Here he commenced his *General History of Music*. In 1760 he returned to London, at the request of the Duke of York, where his compositions, and the musical skill of his eldest daughter, then eight years of age, excited admiration. In 1769 he took the degree of Doctor of Music at Oxford. In 1770 he visited France and Italy, and, two years afterwards, the Netherlands and Germany, for the sake of his great work. He published accounts of both tours. After his second return he became a fellow of the Royal Society. In 1776 appeared the first volume of his *General History of Music* from the earliest ages to the present period (4to), the second in 1782, and the third and fourth in 1789. He is the author also of several other valuable works, among which are the *Memoir of*

Handel, and a life of Metastasio. He died on April 12th, 1814, in the office of organist at Chelsea Hospital, and in receipt of a pension of £300. He wrote most of the musical articles in *Rees's Cyclopædia*. His daughter, Frances or Fanny (Madame d'Arbly—see ARBLY), well known as an authoress, published a memoir of her father. See also next article.

BURNBY, CHARLES, second son of the historian of music, a classical scholar and critic of high reputation. He was born at Lynn, in Norfolk, on Dec. 4th, 1757, and received his education at the Charterhouse School, at Caius College, Cambridge, and King's College, Aberdeen, where he took the degree of M.A. He carried on a private school, distinguished himself as a writer in the *Monthly Review* and the *London Magazine*, to which he contributed many articles on classical literature; subsequently entered into holy orders, and obtained some preferment in the church. He died on Dec. 28th, 1817, and his valuable collection of books, many of them enriched with manuscript notes, was purchased by Parliament for the British Museum.

BURNING-GLASS, a lens which readily brings the rays of light that fall upon it to a focus so as to cause them to kindle any combustible matter on which they are directed. The lenses commonly used as burning-glasses are convex on both sides. If a second lens, of a smaller focal distance, is placed between the first and its focus, so as to intercept the rays which pass through the first, the effect is greatly augmented. Glasses of this kind have been made with a diameter of 2 or 3 feet. Several accidents in modern times have shown that conflagrations may be caused by convex water-bottles, &c., which have the form of burning-glasses, if the rays of the sun are concentrated by them upon combustible substances lying within their reach. Burning mirrors or reflectors with a smoothly-polished surface which reflects the rays of the sun and brings them to a focus may be used like burning-glasses. Spherical mirrors of this kind are the most common, but parabolic ones are the most suitable. The ancients were acquainted with such mirrors, and, as is well known, Archimedes, during the siege of Syracuse by Marcellus, is said to have set on fire the fleet of the latter by means of mirrors. Buffon in 1747, by means of a compound mirror formed of a combination of plane mirrors, set on fire, almost instantaneously, a piece of beech wood covered with tar, at the distance of 66 feet; and with a stronger combination he afterwards burned wood at the distance of 200 feet, melted tin at the distance of 150, lead at the distance of 130, and silver at the distance of 60 feet.

BURNISHER is a blunt, smooth tool, used for smoothing and polishing a rough surface by pressure, and not by removing any part of the body. Other processes of polishing detach the little asperities. Agates, tempered steel, and dogs' teeth are used for burnishing. It is one of the most expeditious methods of polishing, and one which gives the highest lustre. The burnishers used by engravers are formed to burnish with one end and to erase blemishes with the other.

BURNLEY, a parliamentary, county, and municipal borough of England, in Lancashire, about 22 miles N. of Manchester, situated on the small river Brun, near its confluence with the Calder. The town presents a modern appearance, and is, generally speaking, well built, mostly of stone. The town-hall is a large handsome building, erected in 1837; there is also a commodious exchange, and a convenient market hall. Among the churches the chief place is due to St. Peter's, an ancient building modernized. The churches of St. James, St. Paul, and St. Andrew are all recent structures; and there are numerous

other places of worship. There are board and other schools; an ancient grammar-school with modern scientific departments; mechanics' institute and technical school. The manufactures and commerce of Burnley have rapidly increased in recent years. The staple manufacture is cotton goods, and there are large cotton-mills, worsted-mills, and several extensive foundries and machine-shops, with collieries, quarries, and other works in the vicinity. Burnley is situated on the Leeds and Liverpool Canal, has a good water-supply, and has five railway-stations. It seems to have been a Roman station, and various Roman remains have been dug up in and around it. Burnley was made a parliamentary borough with one member in 1867. Pop. in 1871, municipal borough, 40,858; parliamentary borough, 44,320; in 1891, 87,016 and 86,084; in 1901, 97,044 and 95,816.

BURNOOSE, a large kind of mantle in use among the Bedawin Arabs and the Berbers of Northern Africa, commonly made of white or undyed wool, but sometimes also of red, blue, green, or some other colour, and having a hood which may be drawn over the head in case of rain. In Spain also a similar garment is worn which bears the similar name of *albornos*, and the name has also been applied to different kinds of upper garments worn by ladies of other European countries.

BURNOUF, EUGÈNE, French orientalist, was born at Paris on Aug. 12th, 1801; died May 28, 1862. He commenced his studies at the College of Louis-le-Grand, became a pupil in the *École des Chartes* in 1822, passed as a lawyer in 1824, and soon after devoted himself to the study of oriental languages. In 1826 he attracted the attention of men of learning throughout Europe by publishing, in conjunction with his friend Chr. Lassen, an *Essay on the Pali*, or the sacred language of the Buddhists in Ceylon and the Eastern Peninsula, and in 1827 by furnishing an explanatory text to the series of lithographic plates prepared by Geringer and Chabrelle to illustrate the religion, manners, customs, &c., of the Hindu nations inhabiting the French possessions in India. This work was not completed till 1835. In 1832 he was admitted into the Academy of Inscriptions, and in the same year was appointed to the professorship of Sanskrit in the Collège de France, an office which he held till his death. His fame is chiefly due to his having, so to speak, restored to life an entire language, the Zend or old Persian language in which the Zoroastrian writings were composed. Anquetil-Duperron had obtained the text of the extant works of this sacred language of the Persians. It is the glory of Burnouf to have interpreted those works with the aid of the Sanskrit. To this part of his labours belong his *Extrait d'un Commentaire et d'une Traduction nouvelle du Vendidad-Sadé* (Paris, 1830); *Observations sur la Grammaire de M. Bopp* (Paris, 1833); *Commentaire sur le Yagna* (Paris, 1833-36). Burnouf also distinguished himself by his labours on Buddhism. On this subject he published the text accompanied by a translation of the *Bhāgavata Purāna* (Paris, 1840-47); *Introduction à l'Histoire du Bouddhisme Indien* (Paris, 1st vol. 1844), &c. A fortnight before his death, when Burnouf was almost dying, the Academy of Inscriptions elected him secretary for life.

BURNS, ROBERT, Scotland's national poet, was born on the 25th of January, 1759, in a clay-built cottage less than two miles south of the town of Ayr, and not far from the river Doon. His father, William Burness (for so the name was originally spelt), the son of a Kincardineshire farmer, and a worthy and intelligent man, at the time of the poet's birth occupied a few acres of land, and acted as gardener and overseer for a neighbouring gentleman. His mother, Agnes Brown, belonged to Ayrshire.

As a boy the poet received the greater part of his formal education from a young man named Murdoch, an excellent teacher whom his father and a few of the neighbours engaged to instruct their children. Being a great reader (as well as a genius), and fortunate in getting access to books, he was able to make up for some deficiencies under which he might otherwise have laboured; and he acquired indeed a very fair English education, besides some knowledge of French. In 1766 the Burns family removed to the farm of Mount Oliphant in the parish of Ayr, and after a tenure of eleven years, to a larger and better farm, that of Loochlea in Tarbolton parish, where the head of the household died of consumption in 1784. A fresh removal now took place to the farm of Mossiel in the vicinity of Mauchline. Except for some years of comparative prosperity at Loochlea the family had a constant struggle with poverty, and the poet was inured to hard farm work from his boyhood up; but although he is often spoken of as the 'Ayrshire ploughman', he was never a 'ploughman' in the ordinary sense of the word, that is, a mere hired farm servant. Burns began rhyming at the age of sixteen or seventeen, but he wrote nothing of much consequence till half a dozen years later. It was not till 1786 that he published anything, this being the year in which the first edition of his poems appeared, the famous Kilmarnock edition, price three shillings, a copy of which has recently fetched as much as £572. Some of the finest products of his genius had a place in this volume, such as *Halloween*, *The Cotter's Saturday Night*, *The Holy Fair*, *The Two Dogs*, *Poor Mailie*, *Address to the Deil*, *The Farmer's Salutation to his Auld Mare*, *To a Mouse*, *To a Mountain Daisy*, &c. *The Jolly Beggars*, *Death and Doctor Hornbook*, *The Brigs of Ayr*, though not then published, belong to the same period. The book was published as much in the hope of raising money enough to enable the poet to pay his passage to the West Indies, as with the intention of bringing his name before the public, Burns at this time having got himself into difficulties in connection with his future wife, Jean Armour, and being desirous of leaving the country. The Armour scandal was the second of the kind associated with Burns's name; a former affair of the same kind was the occasion of his verses entitled *The Poet's Welcome to his Illegitimate Child*. It was shortly before his public appearance as an author that Burns's love-affair with 'Highland Mary' occurred, but very little is really known regarding this episode in his life. His poems were hailed with delight in his own quarter of Scotland, and from the approval of Prof. Dugald Stewart, Dr. Blair, and especially Dr. Blacklock he was led to seek the applause of a wider circle. Accordingly he now gave up thoughts of emigrating, and got a second edition containing additional pieces published at Edinburgh the following year (1787). By the time it appeared he had been the lion of Edinburgh society for a season, had secured the friendly interest of the Earl of Glencairn, Henry Mackenzie ('The Man of Feeling'), and other persons of note in the metropolis (had also attracted the special notice of Walter Scott, then a lad), and had impressed all who came in contact with him by his extraordinary gifts and personality. He had also spent many a jovial night with company more congenial than grave professors and divines, and had acquired habits that left their mark on his after-life. More successful than many a poet, his second edition produced him something like £600, if not considerably more. After some peregrinations through Scotland and part of England, taking him as far south as Carlisle and as far north as Inverness, and after another visit to Edinburgh,

leading to his high-flown correspondence with 'Clarinda', he married Jean Armour — whom he had led into as great imprudence as before — and settled as a farmer at Ellisland, on the Nith, not far from Dumfries (1788). Fortune did not smile upon him here; probably had he wooed her with more assiduity he would have received more of her favours. However that may be, having first united the occupation of excise-man with that of farmer, he finally gave up the latter calling altogether, and selling off his farm stock and other belongings, retired to Dumfries (Dec. 1791). He continued his poetic career during the Dumfriesshire period, besides carrying on an extensive correspondence; and it is to this period that the great bulk of his songs belong, these being mostly contributed to Johnson's *Scotts Musical Museum*, or written for George Thomson's *Melodies of Scotland*. Other poems written at this time were chiefly short pieces. One important poem, however, by many considered his master-piece, belongs to the year 1790, namely the immortal *Tam o' Shanter*, that inimitable intermixture of humour and diablerie, which first appeared in Captain Grose's *Antiquities of Scotland* (in connection with a plate of Alloway Kirk), the captain describing it as 'a pretty tale wrote expressly for this work'. In Burns's closing years there are various things to be regretted. His wife had reason to complain of his unfaithfulness, Dumfriesshire society began to look somewhat coldly upon him, and he got himself into trouble with his superiors in the excise owing to intemperate language regarding politics and unbecoming sympathies with the early progress of the French revolution, though for this he afterwards made amends by joining the volunteers and writing patriotic verse. As a man of wit and humour as well as genius, a man whose brilliance shone all the more in the convivial circle, his society was naturally much sought after, and he allowed himself to be too often led away by unworthy or thoughtless associates. In short, he lived too fast for his constitution. By 1794 he was not the man he had been, and was afraid that he was 'to suffer for the follies of his youth', as he expresses it. In a letter dated January 1st, 1795, he speaks of already feeling 'the rigid fibre and stiffening joints of old age'. Latterly he suffered much from rheumatism and rheumatic fever, and these ailments, aggravated by imprudent exposure to cold, and probably otherwise complicated, brought about his death. He died at the age of thirty-seven, on July 21, 1796, and was buried at Dumfries, receiving a public funeral. He left five sons and two illegitimate daughters. Two of the sons died quite young. The eldest, Robert, who had something of his father's temperament, though nothing of his genius, held for a number of years a situation in the stamp-office, Somerset House, London, and died at Dumfries in 1857. The two others, after both attaining the rank of lieutenant-colonel in the East India Company's service, died respectively in 1865 and 1872. Mrs. Burns survived her husband for thirty-eight years, dying in 1834, aged sixty-eight. Soon after she became a widow a public subscription was raised in her behalf, and to this fund were added the profits derived from Dr. Currie's edition of Burns's works (1800, 4 vols., with life of the poet), which was published expressly for behoof of the widow and orphans.

In Burns we have perhaps the most remarkable instance among poets of variety and strength combined. Song, satire, narrative, description, dialogue, epistolary and didactic composition, all come within his range; while in turn he delights us with humour, tenderness, pathos, sublimity, homely morality, wit and wisdom applied to the affairs of daily life

What perhaps more than all else conciliates the favour of the reader is the abounding sympathy and kindly feeling of the poet, his tenderness for all things animate and even inanimate. No doubt in one or two cases (as in his unworthy attacks on the living Mrs. Riddell and on the dead Mrs. Oswald) he exhibits a rancour that cannot be overlooked, but such lapses are rare, though of course he was always ready to assail cant and hypocrisy. As one factor connected with his popularity, we may refer to the fact that—apart from some rather out-of-the-way Scottish vocabularies—he is always easily understood, indulges in no subtleties or profundities, and has always a more or less firm grasp on the realities of life. Yet it must be admitted that his poetry is very unequal, and that literature would have been but little the poorer if a good deal of what is included among his published writings had never seen the light. Generally speaking, his purely English poems are only of mediocre value, especially when he is simply following the models of the time and writing rather as the literary man than as the poet, and handling some theme that does not really touch his heart. Burns shows his greatest strength when, wielding his native vernacular with unsurpassable mastery, he sets before us some aspect of Scottish life and character, the manners and customs of his native district, ideas, feelings, or individual portraiture drawn from the rural or village life with which his own life was so closely interwoven. It has frequently been pointed out that Burns's verse is apt to be found defective when judged by a strictly poetic standard. His language may be picturesque, felicitous, and expressive, it may be terse, forcible, and graphic; but true poetic beauty, artistic perfection in the use of words, need hardly be looked for in Burns's verse. Nor did Burns show much originality in choice of subjects or methods of treatment. As a writer he struck out no new path for himself. Steeped as he was in the later vernacular literature of Scotland, he was content to work on the lines laid down by Scottish 'makers' before his day; and having an intense admiration for the writings of such immediate predecessors as Robert Ferguson and Allan Ramsay, he was proud to follow in their steps, and eager to outstrip them, which, being a man of far higher genius, he easily accomplished. Burns's Holy Fair and Cotter's Saturday Night, for instance, were undoubtedly suggested by Ferguson's Leith Races and Farmer's Ingle; and sundry of his epistles, elegies, &c., had also their prototypes among the printed pieces of Ferguson, Ramsay, or Hamilton of Gilbertfield. Burns's favourite forms of stanza, too, were all old favourites with Scottish writers. So also in many of his songs, scraps and snatches of older ditties are interwoven and blended with materials of his own in such a way that it is impossible to say what is Burns's and what belongs to singers of an earlier day. But he has left us many inimitable songs that are unquestionably of his own mint, and that range over the whole lyric field—perfidiously amatory, softly sentimental, melancholy and pathetic; or gay and light-hearted, arch and waggish, martial and patriotic; at one time sounding the praises of friendship, love, or liquor; at another tremulous with tenderness, or breathing the spirit of manly independence. His epigrams are not very brilliant efforts in this line, and are apt to remind us of Dugald Stewart's remark regarding the poet's politics, that 'they smacked of the smithy'. A certain class of humorous effusions at which Burns was an adept, and of which he produced a good many, were intended only for private circulation, and are only here referred to by way of completing this

brief account of a man of many moods. He left a considerable number of letters, of which many are remarkable in various respects, and all are valuable for the light they throw upon the life and character of the writer. On the whole they are lacking in spontaneity and naturalness, and are too often marred by high-flown language and overstrained sentiment. Some of them are formal literary compositions rather than letters, and a certain number betray too plainly the influence of Sterne. In the 'Clarinda correspondence' we have a somewhat extravagant and fantastic series of amatory epistles written to a lady (Mrs. M'Lehose) who was living as a grass-widow in Edinburgh, and with whom the poet became intimate when detained there for a time. In his letters to Mrs. Dunlop, a lady of good position and much older than himself, he appears perhaps at his best as a letter-writer. Of Burns the man little need here be added. His private character has perhaps been brought too much before the light of day by his biographers and critics. If some have painted it in too dark colours, others, it may be, have gone as far in the opposite direction. 'The poor inhabitant below' was well aware of his own faults and follies; and probably he would have been a less interesting figure to most of his own fellow-countrymen, and to many others besides, if he had been less of a sinner and more of a saint. Burns has left a sketch of his early life in his autobiographical letter to Dr. Moore, written in 1787. The chief biographies of Burns are those by John Gibson Lockhart (1828), Robert Chambers in his *Life and Works of Burns* (1851), Alexander Smith, Principal Shairp (*English Men of Letters*), and Prof. Blackie. There are well-known essays and critical and biographical estimates by Carlyle, Prof. Wilson (Christopher North), Prof. Nichol, and Mr. W. E. Henley (the last showing remarkable knowledge and insight). The chief modern editions are those of W. Scott Douglas, Dr. Annandale (containing Lockhart's *Life*, Carlyle's and Wilson's essays, notes, &c.—Blackie & Son, publishers), Robert Chambers (remodelled edition by Dr. W. Wallace), and Henley and Henderson (poetry only, with annotations and Mr. Henley's essay).

BURNTISLAND, a royal burgh and seaport of Scotland, in Fife, on the N. shore of the estuary of the Forth, $7\frac{1}{2}$ miles N. by W. Edinburgh. It is picturesquely situated, and being a favourite summer residence and bathing-place as well as a busy port, it is rapidly improving. An abundant supply of water has been introduced. It has four churches (Established, Free, United Presbyterian, and Episcopal), a town-hall, music-hall, mechanics' library, a large board school, &c. The harbour is capacious, of great depth, and of easy access. A dock with an area of $5\frac{1}{2}$ acres was completed in 1878, and extensions have since been made. A second wet dock is being constructed with a depth of 28 feet on the sill, and provided with coal-shipping machinery of the most modern type. Vegetable oil and oil-cake are made, and there are railway repairing works and a distillery. Burntisland is a steamboat ferry station on the North British Railway, and is also connected with the Forth Bridge. It unites with Kinghorn, Dysart, and Kirkcaldy in sending a member to Parliament. Pop. in 1891, 4692; in 1901, 4726.

BURROUGH, or BOROUGH, STEPHEN, an early English navigator who was employed to search for a N.E. passage to the Indies, was born in Devonshire on Sept. 25th, 1525. He set out in 1556, and after doubling the North Cape, sailed along the N. coast of Russia, touched at Nova Zembla and the Isle of Walgatz, and reached 70° N. lat. He then continued his course eastward, to search for the mouth of the Ob,

which was the special object of his voyage, but soon encountered such violent winds and masses of ice that he was constrained to return. The account of his voyage, contained in Hakluyt's Collection, proves him to have been an active and intelligent sailor.

BURSARY, an endowment in one of the Scotch universities, corresponding to an exhibition in an English university, and intended for the support of a student during his ordinary course, and before he has taken a degree in the faculty in which he holds the bursary. Each of the four universities of Scotland has a greater or smaller number of bursaries. As yet the University of Aberdeen is better provided than any of the others with this class of endowments. Bursaries are in the gift sometimes of the Senatus Academicus of the university to which they belong, sometimes of the town-council of the city in which the university is situated, and sometimes of private individuals. With regard to the manner in which they are bestowed, some are obtained after competitive examination, and others are given by the patrons for special reasons. As the former method of bestowing them is found to be the more beneficial in its results, it is gradually becoming the prevailing one, and at Aberdeen it has always been the prevailing one. Bursaries which are in the gift of the Senatus Academicus are all bestowed in this way.

BURBLEM, a market town and municipal borough of England, in Staffordshire, within the parliamentary borough of Hanley, in 'The Potteries'. It is well built, chiefly of brick; has electric tramways, a fine town-hall, covered market, public baths, hospital, and a mechanics' institute, comprising a free library, a museum, and a school of art. This institute, termed the Wedgwood Institute, was erected in honour of Josiah Wedgwood, who was born at Burlem in 1730. The building is an excellent exemplification of the structural application of ceramics. Burlem has four Established churches, and places of worship for Independents, Baptists, Methodists, and Roman Catholics. It has extensive manufactures of china and earthenware, and carries on coal-mining. Pop. in 1891, 31,999; in 1901, 33,768.

BURTON, SIR RICHARD FRANCIS, K.C.M.G., traveller, linguist, and author, was born at Barham House, Hertfordshire, in 1821, and died 20th October, 1890, at Trieste. He was educated at Oxford, and matriculated there with the intention of entering the church; but in deference to his own urgent request, his father, Lieutenant-Colonel Burton, obtained a commission for him in the East India Company's service. He joined the army in 1842, served for some years in Scinde, under Sir C. Napier, explored the Neilgherry Hills, published an important work on Scinde, and acquired a complete knowledge of the Persian, Afghan, Hindostanee, and Arabic languages. Returning to England in 1851, he soon afterwards set out to explore Arabia, disguised as an Afghan pilgrim, and published on his return a Personal Narrative of a Pilgrinage to El-Medinah and Mecca as the result of this daring adventure. His next expedition was into the Somali country in East Africa, from whence he proceeded to the Crimea, where he was chief of the staff to General Beaton, and organized the irregular cavalry. After peace was proclaimed, Burton set out in 1856 along with Captain Speke to explore the lake region of Central Africa. The expedition was absent for three years, and during that time the great Lake Tanganyika was discovered by Burton. Subsequently he made a journey in the Western States of North America, and published an account of the Mormon settlement at Utah, in his City of the Saints. In 1861 he married, and he received, the same year, an appointment as consul at Fernando Po. While fulfilling his duties

here he explored the Bight of Biafra, visited the Cameroon Mountains, and conducted a dangerous mission to the king of Dahomey. Afterwards he was transferred to the consulate of Santos in Brazil, and here he explored his own province, visited the Argentine Republic, crossed the continent to Chili and Peru, returned home after exploring the Pacific coast, and published his Explorations of the Highlands of Brazil. He was now (1871) made consul at Damascus, but was soon recalled; and in the following year, after a journey to Iceland, an account of which he wrote, he was appointed consul at Trieste. While occupying this position he led two expeditions into Midian (1876-78); and in company with Commander Cameron he conducted an expedition into the gold-producing country behind the Gold Coast. He remained English consul at Trieste until his death. In his latter years his services to geographical science were acknowledged by the gold medals of the French and English geographical societies, while in 1886 his services to his country were tardily recognized by the honour of knighthood. Besides the books of travel already mentioned, he was the author of many others, such as: The Lake Region of Central Africa (1880); Abeokuta, or an Exploration of the Cameroon Mountains (1883); Narrative of a Mission to the King of Dahomey (1864); The Nile Basin (1869); Vitram and the Vampire (1869); Two Trips to Gorilla Land (1875); Uluma Thule, or a Summer in Iceland (1875); and The Gold Mines of Midian (1878). He was also the translator of Camoens' *Lusiads* (1880); His *Tyric*, and a *Life and Commentary* (1881); the author of a *History of the Sword* (1883); and the translator of a literal version of *The Thousand Nights and a Night* in 16 volumes (1885-88), of which an expurgated edition has also been published.

BURTON, ROBERT, a writer of the seventeenth century. He was born at Lindley in Leicestershire, in 1576, educated at Oxford, embraced the ecclesiastical profession, and became rector of Seagrave, in Leicestershire. His learning, which was various and extensive, is copiously displayed in the *Anatomy of Melancholy*, by Democritus Junior, first published in 1621, and repeatedly reprinted. Burton died in 1640, and was buried at Christ Church. He was a man of integrity and benevolence, but subject to strange fits of hypochondriac melancholy, which rendered his conduct flighty and inconsistent. He is reported also to have undertaken the composition of his *Anatomy of Melancholy* with a view to the dissipation of his morbid feelings. Among those who have been most deeply indebted to Burton is Sterne, as may be seen in his *Tristram Shandy*.

BURTON-UPON-TRENT, a mun. and co. bor. of England, in Staffordshire, on the N. bank of the Trent, in a low, level situation. It is substantially built. Malting and iron-founding are carried on to a considerable extent, but it is chiefly celebrated for its excellent ale, of which vast quantities are made, both for home consumption and exportation. There are about twenty breweries at work, giving employment in the various departments of the trade to about 10,000 men and boys. The largest brewing establishments are those of Messrs. Bass & Co., and Messrs. Alsopp, the former of which covers considerably more than 100 acres of ground. These two companies alone are said to pay to government £800,000 annually as duty on the ale brewed by them. Contrary to common usage, the brewers in preparing the ale employ hard water obtained from wells, instead of soft water. There are in all about fifty places of worship in the town, which also possesses a grammar-school, girls' high-school, numerous board and other elementary schools, four blocks of almshouses &

dispensary and infirmary, a public library and reading-rooms, school of science and art, handsome public baths, &c. Pop. in 1861, 14,351; in 1871, 20,378; in 1881, 39,288; in 1891, 46,047; in 1901, 50,336.

BURTSCHIED, or **BORSCHT**, a town in Rhinish Prussia, and properly a suburb of Aix-la-Chapelle. It carries on extensive manufactures, particularly of woollens and yarns. Its thermal springs, which rise in the hill immediately above the town, are celebrated.

BURY, a mun., county, and parl. borough of England, in Lancashire, 8 miles north-north-west of Manchester. It is well situated on a rising ground between the Irwell and the Roche, and being much improved in recent times now presents the appearance of a clean and well-built town. The town has a handsome town-hall, an atheneum, a technical school and art-gallery, the savings-bank, the Bury Bank, Trevelyan Club and Philips Hall, grammar-school, public baths, railway-station, &c. Among the churches, St. Mary's (the parish church) and St. Thomas's are perhaps the finest, being highly ornate Gothic buildings with tower and spire. There is also a handsome chapel belonging to the United Methodist Free Church, a fine Presbyterian church, and a Roman Catholic chapel. The staple manufacture is that of cotton, and there are also large woollen factories, bleaching and printing works, dyeworks, foundries, &c. Sir Robert Peel was born at Chamber Hall in the vicinity in 1788, and a bronze statue of him adorns the town. Bury was made a parl. borough returning one member in 1832. Pop. of parl. bor. in 1891, 55,491; in 1901, 56,408; of mun. bor. in 1891, 57,212; in 1901, 58,028.

BURYING-BEETLE (*Neorophorus*), the name of a genus of insects belonging to the order Coleoptera, remarkable for the keenness of their scent, which enables them to discover in the course of their flight, the bodies of rats, mice, moles, &c., recently dead. When they have discovered one several of them gather about it, and creeping under it, begin hollowing out the earth with their head, until the body gradually sinks to the depth of 6 inches or even a foot. They then cover it over with the earth they have dug out, and make the spot level. This labour requires not less than twenty-four hours. In the body which is thus buried the insects deposit their eggs, out of which, in less than a fortnight, the dirty-white larvae creep, and regale themselves on the store of food which has been prepared for them. Before entering into the pupa state the larvæ go somewhat deeper into the earth, and thereupon the development takes place so rapidly that, under favourable circumstances, there may be three generations in a single year. The species are common everywhere. One of the best known is the *Neorophorus vespillo* of Linnaeus, with red antennæ, and two bright orange bands across the back. See plate at ENTOMOLOGY.

BURYING-PLACES. The custom of burying the dead in public places prevailed among the most ancient nations. The Romans had this custom in the earliest times. Afterwards, in the flourishing periods of the republic, they burned their dead and kept the ashes in tombs, collected in urns (*urnæ*). The ancient Germans buried their dead in the groves consecrated by their priests. With the introduction of the Christian religion consecrated places were appropriated for the purpose of general burial; and it was regarded as ignominious not to be buried in consecrated earth. The deprivation of the rites of burial was, therefore, part of the punishment of excommunication. The Romans were accustomed to provide their graves at least with a stone, upon which was inscribed the name of the deceased, and the wish, *Sit illi terra levis* (that is, May the earth rest

lightly upon him). This custom was preserved by the Christians. The Egyptians, Greeks, and Romans erected over the graves of men of rank, or persons otherwise remarkable, pyramids, mausoleums, or temples. After the introduction of Christianity little churches, called *chapels*, were erected over the dead. Early Christian martyrs were often buried in caverns, which by degrees were enlarged to spacious subterranean vaults. Subsequently, others considered themselves happy if their bones were allowed to repose near the ashes of a martyr. As early as the fourth century the Christians built churches over the sepulchres of the holy martyrs; and in the belief that a place was sanctified by their ashes, they anxiously sought out, on the erection of new churches in cities, or the transformation of heathen temples into Christian churches, the remains (relics) of the martyrs, and buried them under the altar of the new church to communicate to it a character of greater sanctity. It gradually came to be universally considered among the Christians a privilege to be buried in the neighbourhood of a saint. The Emperor Constantine, who died in 337, was the first person that we know of who ordered his tomb to be erected in a church. This was done in the Church of the Apostles at Constantinople, of which he was the founder, and therefore probably considered himself as peculiarly entitled to this privilege. He was soon imitated by the bishops, and latterly all those who had enriched the church were distinguished by this honour. The Emperors Theodosius and Justinian, indeed, forbade the erection of sepulchres in churches, but in vain. Leo the Philosopher again permitted them to everybody. At present the burying in churches is almost everywhere suppressed, or at least permitted only under certain restrictions. Even in Naples and Rome the general practice of erecting sepulchres in churches was forbidden in 1809, and the foundation of burial-places without the city was provided for. The custom introduced by the communities of Moravian Brothers, who form their burial-places into gardens, is now becoming general; and cemeteries, instead of exhibiting merely dull ranges of tombstones, are adorned with flower-plots and ornamental shrubbery. The celebrated burying-place of *Père la Chaise*, near Paris, is one of the most beautiful and interesting spots in the world. (See also CATACOMBS.)

BURY ST. EDMUND'S, a parliamentary and municipal borough in Suffolk, England, well built and delightfully situated on the Lark, 26 miles from Ipswich. It contains four churches, two of them being fine old Gothic edifices. There are places of worship belonging to the Independents, Methodists, Baptists, and others; and among other buildings a shire-hall, a guild-hall, a handsome corn exchange, atheneum, with library, &c. Agricultural implements are manufactured, and there is a large trade in agricultural produce. Of many benevolent institutions the principal is a free grammar-school founded by Edward VI. Bury St. Edmund's sends one member to Parliament. It is an ancient place, and derived its name from St. Edmund, a king of the East Angles, who was buried here. The barons in John's reign met here, and swore to obtain the ratification of Magna Charta. Bury St. Edmund's contains the remains of an abbey, once the most wealthy and magnificent in Britain. Pop. in 1871, 14,928; in 1881, 16,111; in 1891, 16,630; in 1901, 16,255.

BUSACO, a convent in Portugal, in the province of Beira, occupied by Carmelite monks. It is memorable for the battle, September 27, 1810, between Masséna and Wellington, who, on a retreat before the superior forces of the former, availed himself of the favourable position of the Sierra for checking the pursuit.

BUSEBECQ, or **BUSEBECQUE**, **ODIER GHEILAIN DE**, Belgian diplomatist and author, the natural son of a nobleman, was born in 1522 at Comines, in Flanders, and legitimated by Charles V. After having studied in the most celebrated universities of Flanders, France, and Italy, he entered the service of Ferdinand, king of the Romans, who in 1555 sent him as ambassador to Constantinople. After seven years he returned home, and next was sent to accompany the Archduchess Elizabeth (who was to be married to Charles IX.) on her journey to France. Busebecq remained there as steward to Elizabeth, and when she left France, after the death of her husband, he remained as ambassador of Rodolph II. He died in 1592. We have remaining two important works of his: 1. *Legationis Turcoss Epistolæ quatuor* (Four Letters of the Turkish Embassy), in which the policy, the power, and the weakness of the Porte are so profoundly and clearly explained, that even at present information may be drawn from them; and 2. *Epistolæ ad Rudolphum II.* (Letters to Rodolph II.), a very important work for the history of those times. His style is pure, elegant, and simple. During his stay in Turkey he collected Greek inscriptions and manuscripts.

BUSBY, RICHARD, a celebrated headmaster of Westminster School, was born on Sept. 22nd, 1606, at Luton (also known as Sutton St. Nicholas), in Lincolnshire. Educated at Westminster School, he entered Christ Church, Oxford, in 1624, and graduated B.A. four years later and M.A. in 1631. He became a tutor of his college, and at the age of thirty-three was appointed prebendary and rector of Oudworth, in Somersetshire. In 1638 Osobolston, the headmaster of Westminster, was deprived of his post for disrespectful references to Laud, and Busby was provisionally appointed to succeed him. Two years later he was confirmed in this appointment, which he held continuously till his death. Busby was a staunch Royalist and Churchman, yet he managed to retain his headmastership during the civil war and commonwealth. He was, however, deprived of his prebend and rectory, but almost immediately after the accession of Charles II. he was appointed to the prebend of Westminster. A month later he became canon-rectory and treasurer at Wells, and he bore the ampulla at the coronation of the king. As a schoolmaster he has gained a reputation for extreme severity, but he numbered among his pupils many of the greatest men of his time, among them Dryden, Locke, Atterbury, South, Henry, and Hooper, several of whom speak of him in terms of high praise. He is said to have boasted that at one time no fewer than sixteen of the whole number of bishops had been bled by him. Several writers of his time testify to his piety, and his liberality to the church was great. He built and endowed a fine church at Willan, and subscribed largely towards the repairing of Christ Church College at Oxford. At his death, which took place on April 6th, 1695, he left £520 a year to establish a course of lectures known as the Busby Lectures. His published works consist of school-books, which are long out of date. He was buried in Westminster Abbey.

BÜSCHING, ANTON FRIEDRICH, German geographer, was born on Sept. 27th, 1724, at Stadthagen, in Schaumburg-Lippe, and studied theology in Halle from 1744. When acting as a travelling tutor he became convinced of the defects of existing geographical treatises, and resolved to write a new one, which he began on his return to Germany (1752), by publishing a short *Description of Schleswig and Holstein as a specimen*. In 1754 he was made professor of philosophy in Göttingen. In 1766 he was made director of the united gymnasiums of Berlin and

the suburb Kolln, and died there on May 28th, 1793. Before his great work, *Allgemeine Erdbeschreibung*, which he began to publish in 1754 in separate volumes, and which, though not entirely completed by the author, passed through eight editions during his life, neither the Germans nor any other nation had a thoroughly scientific geographical work.

BUSEMBAUM, HERMANN, a Jesuit, famous for his *Medulla Theologiae Moralis* (Marrow of Moral Theology), was born at Nottuln, in Westphalia, 1600, and died at Münster in 1668. His work was much used in the seminaries of the Jesuits, and passed through many editions, in the course of which it was enlarged by subsequent commentaries. In the middle of the eighteenth century it was found to contain principles concerning homicide and regicide, which appeared the more reprehensible on account of Damien's attempt on the life of Louis XV. The Parliament of Toulouse caused the work to be publicly burned, and the Parliament of Paris condemned it. Against both these sentences Father Zaccaria, an Italian Jesuit, with the permission of his superiors, stepped forward as the defender of Busembaum; but his defence was condemned by the Parliament of Paris.

BUSENTO, a river of Southern Italy, in the province of Cosenza, joining the Grati at Cosenza. The Goths dug Alario's grave in the bed of this stream, which they temporarily diverted from its course.

BUSHEL, an English dry measure, containing 8 gallons or 4 pecks. The standard English bushel (12 Henry VII.) contains 8 gallons of wheat, each of 8 pounds troy, each of 12 ounces, each of 20 pennyweights, each of 32 corns of wheat that grew in the middle of the ear. In 1696, a duty being laid upon malt, it became necessary to ascertain the exact contents of the *Winchester bushel*, as that of Henry VII. was called. It was found that the capacity was 2150.42 cubic inches of pure water, equivalent to 1191 oz. 13 dwts. troy. This bushel is still used in the United States. The capacity of the *imperial bushel*, prescribed by the Act of Uniformity (5 Geo. IV. cap. lxxiv.), contains 2218.20 cubic inches, and holds 80 lbs. avoirdupois of pure water.

BUSHIRE, or **BUSHARR**, a city of Persia, the chief port of the Persian Gulf, situated about 120 miles to the south-west of Shiraz and 150 from the mouth of the Shat-el-Arab, in the province of Farsistan. The name is by some derived from Abu-Shehr, meaning 'father of cities'. From a distance the town, which is surrounded by a half-ruined wall of earth, has a somewhat attractive appearance, but a nearer view reveals the meanness and dirtiness characteristic of eastern towns. It is situated on a small sandy peninsula, separated from the mainland by a swamp, and has a very unhealthy climate. Water is not easily obtainable, and earthquakes occasionally occur in the neighbourhood. The anchorage is some two miles from the city, and is not very good, but a considerable trade is carried on with the United Kingdom, India, China, and other countries. The principal exports are opium, wheat, tobacco, almonds and other fruits, &c.; their total value in 1897 being £392,532. The imports comprise cotton goods, arms and ammunition, sugar, tea, indigo, various metals, &c.; the total value in 1897 being £1,145,329. Bushire was occupied by Britain during the Persian war of 1856-1857. Pop. about 15,000.

BUSHMEN, or **BOSJESMANS**, a dwarf African race inhabiting the Kalahari desert and some of the more northerly portions of Cape Colony. Their average height seems to be rather less than five feet, but the Bushmen of the Cape are more stunted than those living farther north. The skin is of a dirty yellow.

fish colour, and they have repulsive countenances, with a somewhat prominent forehead, thick lips, large ears, and small, deep-set, restless eyes. Their small hands and feet are about the only features in their physical structure suggestive of delicacy or beauty. They care little about dress, being content with the untanned skins of wild beasts, though they are reported to be fond of ornament. They are essentially a nomadic people, neither tilling the soil nor rearing domestic animals, but subsisting on the flesh of various wild animals, and on wild bulbs, roots, fruits, &c. Their only weapon is the bow and poisoned arrow, in the use of which they show no small skill; and in order to get within range of the ostrich they dress themselves in an ostrich's skin in such a way as to closely resemble one of these animals. The neighbouring Boers and Hottentots suffer much from their cattle-lifting propensities, and are in consequence their inveterate foes. A species of *Sonchiera* supplies them with a fibre from which they make ropes. The Bushmen have no fixed dwellings, but reside in rocky caves or in nest-like structures rudely formed in a bush or bogie, whence their ordinary Dutch and English names. They seem to live in more or less undefined groups presided over by chiefs, but their organization is very primitive, and the chief's authority extremely uncertain. Marriage proper can scarcely be said to exist among them, for the men may divorce their wives whenever they please, and their language does not distinguish between married and unmarried women. Their language is described as a combination of chattering, hissing, and grunting nasal sounds, with several peculiar *clicks*, as they are called. These clicks are quite unpronounceable by Europeans, and are found outside the Bushman tongue only in the Hottentot, though in the latter they are fewer in number. Despite their degraded physical and social condition, however, they are a fairly intelligent race, much more animated and quick of apprehension than the neighbouring Hottentots. They have great powers of mimicry, and the many coloured drawings of men and animals which they have executed on rocks and elsewhere testify to great artistic skill. It is said that in these drawings 'perspective and foreshortening are found correctly rendered'. The Bushmen have also a large collection of folk-tales dealing mostly with animals. The ethnical relation between the Bushmen and the Hottentots has been and is still to some extent a matter of controversy; but the former are now generally regarded as a degraded aboriginal stock, from which by admixture with Bantu elements the latter have been derived. See plate at article AFRICA.

BUSHNELL, HORACE, American clergyman, was born in New Preston, Connecticut, on April 14th, 1802, and died at Hartford, in the same state, on Feb. 17th, 1876. In his youth he worked in a fulling-mill, but on graduating at Yale College in 1827 he devoted himself first to journalistic and afterwards to educational work. He then studied law and theology at Yale, where he was a tutor for a time, and in 1833 he began his brilliant pastorate of the North Congregational Church of Hartford, from which he retired owing to failing health in 1859. In 1849 he published a work entitled *God in Christ*, containing a view of the doctrine of the Trinity which many regarded as heretical, and for which he had to stand his trial. He succeeded, however, in absolving himself, and in 1861 he published his defence under the title *Christ in Theology*. One of his chief contentions was that exactness of expression in regard to spiritual and theological matters is impossible. Among his other works are *Christian Nurture* (1847); *Nature and the Supernatural* (1858); *Character of Jesus* (1861); *Woman Suffrage, the Reform against Nature* (1869); and *Forgiveness and Law* (1874). His daughter,

Mary B. Cheney, published his *Life and Letters* in 1880.

BUSIRIS, a mythical Egyptian king mentioned by Apollodorus. Egypt had been for nine years subject to famine when Phraëus, a soothsayer of Cyprus, arrived to inform the king that the scarcity would not cease unless a foreigner were sacrificed each year to Zeus. Busiris made Phraëus the first victim, and established the custom of immolating a foreigner every year. Hercules was one year seized and bound to the altar, ready to be offered up, when he burst his chains and put Busiris to death.

BUSKIN (Latin *cothurnus*), a kind of high-soled shoe worn upon the stage by the ancient actors of tragedy, in order to give them a more heroic appearance. The Greek word *cothurnos* denoted, however, a sort of closed boot, fitting either foot, worn by women; the tragic boot being the *embates* or *embas*. The word is figuratively employed by the Latin authors for tragedy itself, or for a lofty and elevated style.

BUSSORAH. See BASSORA.

BUSSY D'AMBOISE, LOUIS DE CLERMONT D'AMBOISE, SEUR DE, born in 1549, acquired an infamous notoriety by the prominent part he took in the massacres of St. Bartholomew. He afterwards attached himself to the Duke of Anjou, and obtaining the command of the castle of Anjou, made himself universally odious by his pride and oppression. He had the meanness to pander to the low passions of the Duke, and undertook to seduce the wife of the Count of Montmoreau. The intrigue cost him his life. Montmoreau having come to the knowledge of it, obliged his wife to write Bussy, giving him a rendezvous at the castle of Constançiere. Bussy arrived with a single confidant, and was immediately met by the count and several men, who killed him, Aug. 19, 1579.

BUSSY-RABUTIN, or ROGER DE RABUTIN, COMTE DE BUSSY, born at Epiry, in Nivernois, in 1618, entered the army at the age of thirteen, and made several campaigns. Turenne, in a letter to the king, describes him as the best officer in his army, as far as songs were concerned. His scandalous chronicle entitled *Histoire Amoureuse des Gaules* cost him the loss of his official appointment and a year's imprisonment in the Bastille. He was a correspondent of Madame de Sévigné, and is often mentioned in her letters. He had the vanity to suppose that he excelled her in her peculiar art, and his letters were afterwards published in seven volumes. He died at Autun in 1693.

BUST (Fr. *buste*, It. *busto*, of uncertain origin), in sculpture, the representation of that portion of the human figure which comprises the head and the upper part of the body. The bust did not become common among the Greeks till the time of Alexander, nor among the Romans till the time of the empire. Among the Greeks, the portrait busts of the learned formed an important branch of art. The artists in these works exhibited a singular power of expressing character, and in this way we possess what are probably faithful likenesses of Socrates, Plato, and other distinguished persons. The first Roman bust that can be depended upon as giving a correct likeness is that of Scipio Africanus the elder. The number of busts of the time of the Roman Empire is very considerable, but those of the Roman poets and men of letters have not been preserved in so large numbers as those of the Greeks. A collection of drawings of antique busts was made by Fulvius Ursinus, and published with the title *Illustrum Imagines* (Rome, 1569, and Antwerp, 1606); subsequently a similar collection was published in the *Iconographie Grecque* of Visconti (Paris, three vols. 1811), which

was followed by his *Iconographie Romaine* in 1817-29 (Paris, four vols.)

BUSTARD, the trivial name of a species of wading bird belonging to the genus *Otis*, and to the family *Presbiteres*, C. The great bustard (*Otis tarda*) is the largest of European land birds, the male weighing, on an average, 25 pounds. It is 4 feet in length, and measures 9 feet from tip to tip of the wings. The head and neck are ash-coloured, and there is a tuft of feathers about 5 inches long on each side of the lower mandible. The back is transversely barred with black and bright ferruginous colours, and the primaries are black. The tail consists of twenty feathers, broadly barred with red and black. The belly is white, the legs dusky, naked, and without a hind toe. The female is but half the size of the male, and has the crown of the head of a deep orange colour, traversed by red lines; the remainder of the head is brown. She otherwise resembles the male, except that the colour of her plumage is less bright. This species is found in most of the open and level districts of the s. and s. of Europe and in Asia, but is now only a rare visitant to England, though formerly common. They are very shy and vigilant, and by no means easy to shoot. They run with great speed, and add their course with their wings, like the ostrich. Although they rise on the wing with difficulty, they are said to fly many miles without resting. They feed on grain, seed, worms, &c., and lay two eggs, as large as those of a goose: these are of a pale olive tint, with dark spots. The nest is merely a hole scraped in the earth. They do not wander far from their accustomed haunts, seldom going to a greater distance than 20 or 30 miles. Their flesh is esteemed. See plate at ORNITHOLOGY.

BUTCHERS have been much the same in all ages and countries, and we know not of any great improvements that modern art or science has introduced into the practice of slaughtering animals. The ancient Scythians and their Tartar descendants seem to be peculiar in their taste for horse-flesh. The Romans appear to have loved beef, and veal, and mutton, as well as the modern Europeans and their American descendants: '*cara omnia*', is the complaint of the old comic writer, '*agninam caram, carum bubulum, vitulinam, porcinnam, omnia cara*'. In Paris, the butcheries, formerly receptacles of filth, and injurious to health, were removed by Napoleon, by a decree issued in 1807, to the outskirts of the city. Five public butcheries were constructed, three on the right and two on the left bank of the Seine. These *abattoirs* or slaughter-houses (French, *abattre*, to fell), consisted of spacious buildings for the reception of the cattle, preparing the tripe, tallow, &c., and reservoirs of water for the service of the establishments. It was from these establishments that the term *abattoir* was introduced into Britain, but they have now been superseded by a single abattoir or set of connected abattoirs covering an area of about 67 acres. Every part of the animal—bones, horns, hoofs, blood, intestines, hide, tallow—is used for the fabrication of glue, jelly, Prussian blue, sal-ammoniac, &c. In London, the carcass butchers kill the meat, and supply it in large quantities; the retail butchers sell it out to the consumers. The consumption of meat in the United Kingdom amounts to about 109 lbs. per head of population, in France 77, in Germany 64, in Russia 20 per annum. The Jews usually have their own butchers, who are licensed by the rabbis. They cut the throats of the animals, never knocking them down, according to the usual practice. The meat is called *kosher* meat. In some countries the method of slaughtering cattle by penetrating the spinal marrow is practised.

BUTCHER'S BROOM (*Ruscus*), a genus of plants

belonging to the natural order Liliaceae. The flowers are dioecious, and of a green colour, and rise from branchlets dilated in the form of leaves, and hence called 'false-leaves'. It is a shrubby evergreen plant, with angular stems. There are several species. The *Ruscus hypophyllum* (from Gr. *hypo*, under, and *phyllon*, a leaf, because the flowers arise from the inferior surface of the false leaves) is a native of Italy. The common butcher's broom (*Ruscus aculeatus*) has ovate false leaves ending in spines. The flowers are small, but the berries are large, like small cherries, and remain hanging on the stalks during the autumn and winter. The root and the berries are employed in medicine as diuretics. In some countries its seeds are roasted, and used to make a beverage like coffee. The *Ruscus hypoglossum* is principally distinguished by its elongated bracts, from the axil of which rise the flowers above the false leaves.

BUTE, a small island of Scotland, lying in the estuary of the Clyde, separated from the county of Argyll mainly by the narrow and picturesque channel, the Kyles of Bute. It has an area of 30,000 acres, belonging principally to the Marquis of Bute. It is about 15 miles long, and the average breadth is 8½ miles. It has no remarkable elevations, its highest summit, Kames Hill, being only 875 feet high; but it has several pretty little lakes, the principal and most beautiful of which is Loch Fad, 2½ miles long by a quarter of a mile in breadth. Agriculture is in an advanced state, and is yearly improving. A complete system of draining has been introduced, and the most approved rotation of crops is observed. There are 20,000 acres under cultivation. The climate is moist and mild. The herring-fishery is a profitable employment. The only town is Rothesay, the ruins of the castle of which, formerly inhabited by the Scottish monarchs, still remain. It gave the title of Duke of Rothesay to the heir-apparent of Scotland. The title is now transferred to the Prince of Wales. The county of Bute seems one member to Parliament, and comprises the islands of Bute, Arran, Great Cumbrae, Little Cumbrae, Inchmarnock, and Pladda, the total area of which is 140,327 acres. Of this about a sixth is under cultivation, by far the larger portion of this being in the island of Bute. Arran is about double the size of Bute, but the other islands belonging to the county are small. Pop. (1891), 18,408; (1901), 18,788.

BUTE, JOHN STUART, EARL OF, a British statesman, born at Edinburgh in 1718, succeeded his father as third earl in 1728. His grandfather was created a peer in 1703, and the family was connected with the royal Stuart line. In his youth Bute seemed devoted to pleasure, and little inclined to engage in politics; nevertheless, in 1737, after the death of a Scottish peer, he was chosen to fill his seat in Parliament. In consequence of his opposition to the measures of the ministry he was left out when a new Parliament was convened, in 1741. Offended by this neglect, Bute retired to his estates, and lived there, wholly secluded, till the landing of the Pretender in Scotland in 1745 induced him to go to London, and offer his services to the government. Notwithstanding this manifestation of zeal, if he had not been brought forward again, if he had not attracted the notice of the Prince of Wales, at an exhibition of private theatricals, in consequence of which he was invited to the court. Here he soon gained influence, and succeeded in making himself indispensable to the prince. At his death, in 1761, he was appointed, by the widowed princess, chamberlain to her son, and was intrusted by her with his education. Bute never lost sight of his pupil, and possessed so much more influence with the Princess of Wales than her son's particular tutor, the Earl of

Harcourt and the Bishop of Norwich, that they resigned their offices. Lord Waldegrave and the Bishop of Lincoln, who were chosen in their stead, opposed him unsuccessfully. George II. died Oct. 25, 1760, and two days after Bute was appointed member of the privy-council. In March, 1761, the Parliament was dissolved. Bute was made secretary of state, in the place of Lord Holderness, and appointed Charles Jenkinson, afterwards Lord Hawkesbury and Earl of Liverpool, his under-secretary. Legge, chancellor of the exchequer, was removed. Pitt (the great Chatham), who saw his influence in the new council annihilated, gave in his resignation the same year. This event made an unfavourable impression on the nation; but Bute, possessing the unbounded confidence of his king, stood at the head of the state. Soon after he removed the old Duke of Newcastle, then first lord of the treasury, and the only one of the former ministry remaining in office, and immediately took this important post upon himself, receiving, at the same time, the order of the Garter. After a severe contest in Parliament, he concluded a peace with France. The terms for England were perhaps not disproportionate to the successes obtained during the war; but it was disgraceful that the King of Prussia, in violation of former treaties, should have been left to his fate. Bute was obliged to bear the most bitter reproaches; yet he succeeded in winning the popular favour, and everything seemed to promise the power of the minister a long continuance. The influence of Bute seemed unbounded, when it was made known, contrary to expectation, that he had resigned his office as prime-minister, and was in future to live as a private man. In 1766 Bute declared in the House of Lords that he had wholly withdrawn from public business, and no longer saw the king; still it was not doubted that his great influence continued. On the death of the Princess of Wales, 1772, he seems first to have given up all participation in the affairs of government. He spent his last years on his estate. A costly botanical garden, a library of 30,000 volumes, excellent astronomical, philosophical, and mathematical instruments, afforded him occupation. His favourite study was botany, with which he was intimately acquainted. For the Queen of England he wrote the Botanical Register, which contained all the different kinds of plants in Great Britain (nine vols. 4to). This work is remarkable, both for its splendour, in which it excels all former botanical works, and for its rarity. Only twelve copies were printed, at an expense of more than £10,000 sterling. Bute died in 1792.

BUTLER, JAMES, Duke of Ormond, an eminent statesman in the reigns of Charles I. and II. He was born at London in 1610, succeeded his grandfather in 1632, and although all his connections were Catholic, his wardship being claimed by James I., he was brought up a member of the Church of England, to which he ever after constantly adhered. When Strafford became lord-lieutenant of Ireland, Butler was made commander of the army, but as it consisted of only 3000 men, he could do little more than keep the enemy in check, and was obliged to agree to a cessation of hostilities; after which, having been created a marquis, he was appointed lord-lieutenant. On the ruin of the royal cause he retired to France. After the execution of Charles he returned to Ireland with a view of raising the people; but on the landing of Cromwell he again returned to France. While abroad he exerted himself to further the restoration of Charles; and when that event was brought about by Monk, returned with the king. Before the coronation he was created duke, and assisted at that ceremony as lord high-steward of England. In 1662

he was again appointed lord-lieutenant of Ireland, which country he restored to comparative tranquillity, and was an active benefactor to it by encouraging various improvements, particularly the growth of flax and manufacture of linen. On the exile of Lord Clarendon, his attachment to that nobleman involved Butler in much of the odium attached to him, and although, on his recall from Ireland, nothing, on the most rigorous inquiry, could be proved against him, he was removed by the machinations of Buckingham. In 1670 a desperate design was formed by the noted Colonel Blood, whom he had imprisoned in Ireland, to seize his person and hang him at Tyburn. The project succeeded so far, that he was one night forcibly taken out of his coach in St. James' Street, placed behind a horseman, and carried some distance; but at length he threw the man and himself from the horse by his personal exertions, and obtained assistance before he could be replaced. The king sent Lord Arlington to request the duke to forgive the insult; who calmly replied, that, 'if his majesty could pardon Blood for his attempt to steal the crown, he might easily pardon that upon his life'; adding, that 'he would obey the king without inquiring his reason'. For six years he was deprived of court favour, but at length was again appointed lord-lieutenant of Ireland, which place he held during the remainder of the reign of Charles, but soon after resigned, his principles not suiting the policy of James. He died at his seat in Dorsetshire, in 1688, leaving behind him the character of a man who united the courtier and the man of honour and integrity better than any nobleman of the time.

BUTLER, JOSEPH, an English prelate of distinguished eminence as a writer on ethics and theology. He was born in 1692, at Wantage, in Berkshire, where his father was a shopkeeper, and a Presbyterian Dissenter. After some previous education at a grammar-school he was sent to an academy at Tewkesbury, with a view to ordination as a minister among the Dissenters. While occupied by his studies he gave a proof of his talents by some acute and ingenious remarks on Dr. Samuel Clarke's *Demonstration of the Being and Attributes of God*, in private letters addressed to the author. He likewise paid particular attention to the points of controversy between the members of the Established Church and the Dissenters, the result of which was a determination to be no longer a Nonconformist; he therefore removed to Oxford in 1714. Having taken orders, he was in 1718 appointed preacher at the Rolls Chapel, and the sermons which he preached while holding this office, especially the first three, *On Human Nature*, occupy an important place in the history of ethical science. In 1736 he was appointed clerk of the closet to the queen. The same year he published his celebrated work, the *Analogy of Religion, Natural and Revealed, to the Constitution and Course of Nature*. In 1738 Dr. Butler was promoted to the bishopric of Bristol on the recommendation of Queen Caroline; and in 1750 obtained his highest preferment—the bishopric of Durham. He died in 1752, and was interred in Bristol Cathedral. His other published works include *Fifteen Sermons preached at the Rolls Chapel* (1726), *Six Sermons preached upon Public Occasions*, &c. The first collected edition of his works was published in 1804 at Edinburgh. An excellent edition of his famous *Analogy* is that of W. Fitzgerald, Bishop of Cork, published in 1860. Mr. Gladstone brought out an edition of his works in two vols. (1896), and also published a volume of *Subsidiary Studies* on Butler.

BUTLER, SAMUEL, a celebrated English poet, was the son of a farmer in Strensham, Worcestershire, where he was born in 1612. He passed some time

in his youth at Cambridge, but never matriculated at the university. He was afterwards clerk or steward to several country gentlemen, and latterly lived in London. He resided some time with Sir Samuel Luke, a commander under Cromwell. In this situation Butler acquired the materials for his Hudibras by a study of those around him, and particularly of Sir Samuel himself, a caricature of whom constituted the celebrated knight, Hudibras. The first edition of Hudibras was published in 1663, and was brought under the notice of the court by the well-known Earl of Dorset. It immediately became highly popular with the prevailing party in church and state, and served as a general source of quotation; the king himself perpetually answering his courtiers out of Hudibras. Celebrated as it rendered its author, it did nothing towards extricating him from indignity. He died on Sept. 25th, 1680, and was buried in St. Paul's Church, Covent Garden, at the expense of his friend Mr. Longueville, of the Temple. A monument was, forty years after, erected to his memory, in Westminster Abbey, by Alderman Barber, the printer. Hudibras, both in its style and matter, is one of the most original and witty works that were ever written. As a work intended to ridicule the Puritans its attraction was great but temporary, but as applicable to classes of character found in all ages, its satire will always be polished. Butler's *Remains in Verse and Prose* appeared in 1759.

BUTTER, in the ordinary sense, is an oily substance produced from milk, principally of the cow. Milk contains on an average 3·40 per cent of fat, and this fat separated from the milk constitutes cream, the agitation of which causes the fat globules to coalesce and form butter. Butter consists of from 88 to 95 per cent of fat, 10 to 14 per cent of water, and small quantities of curd, ash, and milk-sugar. Butter-fat is composed of olein, stearin, palmitin, butyrin, caproin, and a little colouring matter. Among the ancient Greeks and Romans butter was used only as an unguent and medicine, and no doubt the first knowledge of it came to them from the Thracians, Scythians, or other peoples. In warm countries, including the south of Europe, the place of butter is still for the most part supplied by oil.

The butter-producing capacity of different cows, and of different breeds, varies very considerably. The milk of the Jersey cow contains more butter-fat and fat globules of a larger size than the milk of any other breed. The percentage of butter-fat in the milk is also dependent to some extent on the feeding and general management of the cow. Butter is sometimes made by churning the milk, and it is held by some that a superior quality is thus obtained; but the more usual method is to extract the cream from the milk and churn it separately.

Two forces are available to effect the separation of the cream, viz.: the force of gravity, and centrifugal force. Formerly, the first alone was employed, by allowing the milk to stand in vessels for from twelve to forty-eight hours, at the end of which period the lighter specific gravity of the fat globules caused them to collect in a layer at the top. Now, mechanical power, in the form of the centrifugal separator, brings about the same result more rapidly and effectively. The milk is inclosed in a steel vessel which, at several thousand revolutions per minute, and during the heavier milk particles to arrange themselves in a layer round the periphery, while the fat globules form a column around the axis interior to the separated milk. The mechanical details vary with each make of separator. (See DAIRY.)

Before churning, it is usual to allow the cream to undergo a process known as 'ripening' or 'sour-

ing', as butter made from sweet cream differs very little in taste from the cream itself; more butter is made from sour than from sweet cream; and it is by the ripening process that the desired flavour and aroma are obtained. In ripening, the cream is simply allowed to stand in a vessel for a period of from twelve hours to three or four days, during which time certain changes take place.

These changes are due to the growth and multiplication of myriads of bacteria contained in the cream. The process is a true fermentation, during which certain of the bacteria affect the milk-sugar, producing lactic acid; others act upon the fat, and others upon the casein and albumenoids. The bacteria find their way into the cream—or originally into the milk—from various sources, such as the teats and udder of the cow, the milk vessels, and the air of the cowshed or dairy. It is fortunate, that as a rule the bacteria, whose advent the butter-maker cannot entirely prevent, produce a desirable change in the cream; but it sometimes happens that the predominance of one or several unfavourable species will result in an inferior product, and in like manner the predominance of favourable species will produce butter of exceptional aroma and flavour. It is possible to influence the quality of the ripening by what are called 'starters', and these 'starters' are already in use in some butter factories. 'Starters' are pure cultures of bacteria which are known to induce ripening that results in butter of the best quality. A sufficient quantity of a starter is added to the cream, in the hope that the extra number of favourable organisms will influence the ripening of the cream more than those already existing in it. Fair results are obtained in this way, but uniformity of the product is not possible. A better but more troublesome method is to heat the cream to 155° F. for a short time in order to destroy most of the bacteria. When a starter is added to cream thus 'pasteurized', the artificial organisms have a fair field and the ripening takes place under their auspices. This method is being rapidly adopted in butter making countries. A 'natural starter' has been found to give good results where carefully used. A 'natural starter' is simply a quantity of cream obtained from a good dairy, or from cows producing good cream. It is allowed to sour, and then added as a starter to the cream to be ripened. By this method the butter-maker has no control over the kinds of bacteria used, but if the source is good the results are usually favourable.

The butter-fat in the cream is separated from the more fluid portion by agitation in a churn; the agitation breaking what is equivalent to a membrane surrounding each fat globule, and thus allowing them to escape and coalesce. The motion may be either vertical or rotary, and the shape of the churn should allow of easy cleaning. Skimmed cream should be churned at a temperature of from 50° to 55° F., and the churning should cease as soon as the butter has collected in small granules. It is then washed several times with cold water, and worked by mechanical butter-working, which squeezes out the butter-milk and reduces it to a firm consistency. Salt is added either as brine while the butter is still in the churn, or in the dry form in the butter-worker. In the latter form it is one pound of butter is sufficient for 100 pounds of butter, and is used for preserving. The salt also acts on the cream quality and of a pure white colour. Sometimes the juice of carrots, is used to impart a pinkish tint, to give a finer colour to the butter.

Butter is subject to various and numerous taints the injurious bacteria already mentioned as present

in the ripening cream. The commonest cause of tainted or badly-flavoured butter is the want of scrupulous cleanliness in the dairy, whereby malignant organisms are not sufficiently kept under. All vessels should be scalded with hot water at over 150° F., and exposed to fresh air as much as possible. Various weeds found in pastures will affect the milk, and hence the butter injuriously. The taste of tetraps in butter may be obviated by feeding the turnips to the cows after, instead of before milking. Upon an average, 29 lbs. of milk containing 8.45 per cent of butter-fat will yield 1 lb. of butter; therefore a profitable dairy cow giving 7000 lbs. of milk per season will produce nearly 250 lbs. of butter.

Margarine is a substitute for butter, and when properly made is a wholesome and cheap article of diet. By an Act of 1887 all substitutes for butter must be sold as margarine, and all packages containing them conspicuously marked with the name. (See MARGARINE.) In 1898 there were imported into the United Kingdom 900,615 cwts. of margarine, valued at £2,384,384, and of this amount Holland supplied over 844,000 cwts. In the same year the importation of butter was 3,209,153 cwts., valued at £15,961,783. During the ten years from 1887 to 1897 the importation of butter increased by 1,704,687 cwts. The exportation of butter from the United Kingdom is small. The countries from which the supply is principally obtained are, in the order of their importance, Denmark, France, Sweden, Holland, Australasia, and Russia.

BUTTERFLY. See *LEPIDOPTERUS*.

BUTTERFLY, the popular name of a group of lepidopterous insects. The Lepidoptera (Gr. *lepis*, a scale; *pteron*, a wing) have four wings, covered with a large number of minute scales arranged like the tiles of a roof. Their mouth, unlike that of beetles and other orders of insects, is formed for suction, consisting chiefly of a long proboscis, which may be coiled up spirally when not in use. They undergo a complete metamorphosis through the four stages of egg, larva, pupa, and imago or perfect insect. Like other insects their body consists of thirteen segments, the first forming the head, the next three the thorax, and the remaining nine the abdomen. The head bears two projecting organs known as antennae, which are jointed, thread-like organs, abruptly clubbed at the extremities in butterflies, whence these are classed as a sub-order Rhopalocera; in moths (*Heterocera*), constituting the rest of the order, the antennae present greater variety of form (see *MOths*). Just below the points whence the antennae originate, there is in the whole order a many-faceted compound eye, but the ocelli or simple eyes found in the moths are wanting in the butterflies. The thorax is formed of three segments, known as the prothorax, the mesothorax, and the metathorax. Each bears on its under side a pair of legs, and the two latter in addition carry a pair of wings. In many butterflies the fore-legs are imperfect. The wings are covered with an enormous number of very minute scales, which take very different forms in different species. Each scale is attached by a small stalk to a pit in the wing-membrane; and it is partly to the pigments contained in some of the cells of these scales, and partly to refraction at their edges, that the brilliant colouring of butterflies is due. The abdomen consists of nine rings, bearing the spiracles or breathing-openings on their sides; and in the last abdominal segment the anus and sexual organs are found. The two great divisions of lepidopterous insects, Butterflies and Moths, are chiefly distinguished by the character of the antennae. Butterflies, moreover, are usually diurnal in their flight, whilst moths are nocturnal

or crepuscular; and moths when resting do not elevate their wings as the butterflies do—a very noticeable distinction.

The eggs of butterflies are often of striking shape and coloration. They are laid either singly or in groups on a suitable food-plant, and when mature they produce the larvae or caterpillars, which begin at once to feed on the leaves of the plant. The caterpillar, like the perfect insect, consists of thirteen segments, of which the first is the head, bearing antennae. The antennae are, however, very short, and the compound eyes are replaced by three simple ones. The mouth of the caterpillar is mandibulate, that is, formed for biting, and not haustellate, or formed for suction, as in the perfect insect or imago. The next three segments each bear a pair of horny legs, representing those of the perfect insect; but on several of the posterior segments we find also fleshy legs, called pro-legs, of variable number. A caterpillar has thus more than six legs, sixteen being the normal number. As caterpillars grow with incessant feeding they moult or shed their skin in order to renew it, and this process may take place several times before they enter on the pupa or chrysalis stage of existence. The pupae of butterflies differ from those of moths in being angular and gilded, whence the name chrysalis (Gr. *chrysaos*, gold); some spin a slight cocoon, but most are either simply suspended by the tail or have also a silken girdle round the middle. In the pupa state practically no movement is possible, but within the outer covering the parts of the coming butterfly can be distinguished. When the perfect insect emerges from the chrysalis, its wings are small, and in order to allow them to grow and harden it rests for some hours with the wings hanging downwards. Butterflies have many enemies in each of the four states, and amongst them we find many notable cases of protective resemblance or mimicry (which see). Butterflies are arranged in five families. Of these the Nymphalidae have only four perfect legs in both males and females, and in them the chrysalis has no girdle. To this group belong many of the best known of British butterflies, such as the fritillaries, painted ladies, peacock butterflies, admirals, tortoise-shells, &c. The Erycinidae, having four perfect legs in the males, but six in the females, are a small family represented in Britain by only one species, *Nemobius lucina*, the Duke of Burgundy Butterfly. The third family, Lycaenidae, has also six perfect legs in the female, but in it the chrysalis is always suspended. Here belong many familiar small species, such as the Purple Hairstreak (*Thecla quercus*), &c. In the Papilionidae there are six perfect legs in both males and females, and the chrysalis is suspended by the tail and girdled; whilst the Hesperidae, though agreeing with the last-mentioned family in the first character, have the pupa attached by threads or wrapped in a loose cocoon. To the former of these belong the Common Swallow-tail (*Papilio machaon*), the brimstones, whites, clouded-yellows, &c.; and the Hesperidae are represented in Britain only by two or three species, of which the commonest is the Grizzled Skipper (*Hesperia malva*). See accompanying plates, and those at *ENTOMOLOGICAL MIMICRY*.

BUTTERINE. See *MARGARINE*, *BUTTER*.

BUTTONS are of almost all forms and materials, which are either left naked or covered with silk or some other material. In order that the button may be attached to the garment it must either be pierced with one or more holes, or it must have what is called a shank; that is, some means of attachment on the under side. The manufacture of metallic buttons in England dates from the later seventeenth century, and from the first this industry has had its chief

centre, so far as Britain is concerned, in Birmingham. Metal buttons were formerly of a much more showy character than is now generally the case, except in the case of livery or the like. The first patent for cloth-covered buttons was that of Sanders in 1809, and before long many improvements were effected on his method. In 1837 a special form of silk-covered button was introduced by a Mr. Elliott, and became very popular. Vegetable ivory dyed in various colours is very generally used for the buttons of tweed coats; and shirt-studs and various kinds of buttons are manufactured from mother-of-pearl. Glass and porcelain are also used for certain styles of button, and sometimes more costly materials, such as jasper, agate, pearl, &c., are employed. Horn, bone, ivory, wood, and very many other substances have also been employed in their manufacture. One of the most common makes of button is that in which the button has a cloth covering and a mill-board stuffing, with a canvas tuft serving as a shank. The parts that give the button its shape and firmness are a larger and a smaller metal disk, the smaller being on the under side and having in the centre a hole through which the shank projects; and the article is finished by turning in the edge of the larger disk so as to catch the smaller, and subjecting the whole to suitable pressure. The common flat button used for underclothing is also made by means of two metal blanks, but is of somewhat simpler construction.

BUTTRESSES, in Gothic architecture, are lateral projections on the outside of the walls of an edifice, extending from the top to the bottom at the corners and between the windows. They are necessary to support the walls and prevent them from spreading under the weight of the roof.

BUXTON, a market-town in the county of Derby, England, situated in a valley celebrated for its mineral waters. The town consists of an old and a new portion, the latter of which has greatly increased in recent years. There is a town-hall, public offices, free library, &c. The Crescent is a fine pile of buildings, erected in 1781. There are several springs, one of them being tepid, and employed internally as well as externally. The accommodation for visitors is very complete, including excellent hotels and lodging-houses, baths, assembly-rooms, &c. The season extends from May to October. The surrounding scenery is fine, and there is a vast stalactite cavern called Poole's Hole in the neighbourhood. Buxton was known to the Romans; and the unfortunate Mary Stuart while in captivity resided some time at the Hall. P. (1861), 1877; (1891), 7540; (1901), 10, 181.

BUXTON, SIR THOMAS FOWELL, born at Earl's Colne in Essex in 1786, was educated under Dr. Burney at Greenwich, and afterwards at Trinity College, Dublin, where he carried off the gold medal. In 1811 he joined the firm of the celebrated brewers, Truman, Hanbury, & Co., and took an active share in carrying on the business. In 1816, on the occasion of the Spitalfields distress, he made his first public effort in a speech at the Mansion-house, and afterwards succeeded in organizing an extensive system of relief. He next proceeded, in concert with his sister-in-law, the celebrated Mrs. Fry, to examine into the state of prisons; and as the result of his inquiries produced a work entitled *An Inquiry whether Crime and Misery are Produced or Invented by our present System of Prison Discipline*, which attracted great attention, and led to the formation of the Prison Discipline Society. In 1818 he was elected M.P. for Weymouth, and continued to sit for it in successive Parliaments till 1837. He distinguished himself by his enlightened zeal in the cause of humanity, and was long the right-hand man of Wilberforce, who on re-

tiring from public life selected Buxton as the person best qualified to carry out those of his benevolent schemes which remained uncompleted. In 1823 he moved, and with a slight modification carried, a resolution to the effect that slavery, being repugnant to the Christian religion and the British constitution, ought to be abolished. Subsequently in 1831 he made such an impression on the house and country by an admirable speech that government were glad to take the matter into their own hands, and give full effect to emancipation. After his retirement from Parliament the slave-trade occupied much of his thoughts, and he published a work entitled *The Slave-trade and its Remedy*. This led to the expedition to the Niger, which owing to the deadly nature of the climate, notwithstanding the careful precautions used, unhappily failed. In 1840 he was created a baronet. He died in 1845.

BUXTORF, JOHANN, an eminent orientalist, was born in 1564 at Kamen in Westphalia. Being very learned in Hebrew and Chaldaic, in the acquirement of which he obtained the assistance of many learned Jews, he was engaged by the magistrates of Basel to become professor of those languages, which he taught with great success. He died at Basel in 1629. His works are: *Lexicon Chaldaicum Thalmudicum et Rabbinicum*; *Thesaurus Lingue Hebraicæ*; *Hebrew Bible, with the Rabbinical and Chaldaic Paraphrases, the Massora, &c.*; *Hebrew and Chaldaic Dictionary*; *Hebrew Grammar*; *Synagoga Judaica, a Collection of Modes and Ceremonies*; *Bibliotheca Rabbinica*; *Institutio Epistolarum Hebraicæ*; *Concordantiæ Hebraicæ, &c.* His son Johann was also eminent in the same branches of study. He was born in 1599 and died in 1664.

BUZZARD. The buzzards, according to the arrangement of the Falconidae which was made by Vigors, form one of the sub-families (*Buteonina*) of the diurnal birds of prey; characters, a moderate-sized beak, hooked from the base; tail equal. They differ from the falcons chiefly in having a weaker and more elongated bill, in having the third or fourth quill longest, and in wanting the notch or tooth on the upper mandible that is so characteristic of the former. The sub-family consists of several genera. The true buzzards belong to the genus *Buteo*, the characters of which are: bill moderate, rather weak; nostrils somewhat rounded; tarsi short; acrotarsia scutellated; fourth quill longest. The tarsi are either covered with feathers to the toes or half-way. The common buzzard (*Buteo vulgaris*) is distributed over the whole of Europe as well as the N. of Africa and America. In England, Scotland, and Ireland it is in many parts not uncommon, though gradually becoming rarer. It inhabits a variety of situations—rocks, parks, woody districts, &c. Its flight is slow and steady, and it does not generally remain long on the wing. Its food is very miscellaneous, and consists of moles, field-mice, leverets, frogs, toads, worms, insects, birds, and rabbits. The beginning of March is the time at which they pair, and the nest is placed in the fork of a tree or in clefts and ledges of rocks and ravines. It is built of sticks and lined with moss, hair, wool, or other soft materials. The eggs are two, three, or four in number, of an oval form, nearly approaching to round. The colour varies, but generally they are of a bluish or greenish white, spotted with pale or yellowish brown. The length of the buzzard is from 20 to 22 inches, the female being the larger. The plumage is loose and downy; the upper part of the head, the occiput, and cheeks pale brown, streaked longitudinally with darker brown; the whole of the back, wing-coverts, upper tail-coverts, and upper surface of the tail-feathers dark olive-brown, the latter barred with lighter brown, and the feathers

on the former-named parts having the edges lighter coloured; chin and throat almost white; front of the neck, breast, under wing-coverts, belly, and thighs, grayish-white, barred transversely with dark wood-brown; legs and toes yellow; claws black.—The rough-legged buzzard (*B. lagopus*), so called from having its legs feathered to the toes, is also a native of this country. Its habits resemble those of the common buzzard, and like that bird its plumage varies much in colour. The prevailing colours are brown above and whitish streaked and spotted with brown beneath, the lower part of the breast having a belt of brown; length 22 to 24 inches. The genus *Pernis*, to which the honey-buzzard (*P. apivorus*) belongs, has the third quill longest, and the beak rather weaker than Buteo; in other respects it does not differ much from that genus. The honey-buzzard is rather a rare bird in this country, though pretty common in most parts of Europe. It is about 2 feet in length. It feeds on small quadrupeds, birds, reptiles, and insects, especially bees, and should rather be called *bee-buzzard* than honey-buzzard. The marsh-harrier (*Circus erythrionus*) and the hen-harrier (*C. cyaneus*), both natives of this country, belong to the same sub-family.

BY-LAW is a particular law made by a corporation, or by any other distinct portion of the community, for the regulation of the affairs of its members in such of their relations as are not reached by the general law of the land. Such private laws may legally be made by all incorporated bodies, as civic corporations, trading companies, &c., and even by the body of the inhabitants of a town or parish, provided they involve the infraction of no public laws, but are merely calculated to supply their want of application in the particular instance. These private laws are binding only on the members of the body for which they are framed, and will not be recognized as valid unless they appear to be intended for the general good of that body, and not for the mere furtherance of private or personal interests. By the Municipal Corporation Act (5 and 6 William IV. cap. lxxvi.) town-councils are permitted to make such by-laws as may seem to them necessary for the prevention and suppression of such nuisances as are not already made punishable in a summary manner. By 3 Vict. cap. xx., the power of making by-laws was granted to railway companies.

BYNG, JOHN, served under his father, Admiral George Byng, and by his merits, as well as the influence of his name, was raised to the rank of admiral. His attempts to relieve Fort St. Philip, in Minorca, when blockaded by a French fleet under La Galissonière, proved abortive; and his hesitation in engaging the enemy, when a bold attack might have perhaps gained him the victory, excited the clamour of the nation against him. The ministry, who wished to avert the public odium from their unsuccessful measures, beheld with seeming satisfaction the unpopularity of Byng; and when he was condemned by a court-martial they suffered him, though recommended to mercy, to be sacrificed to the general indignation, and he was shot at Portsmouth, March 14, 1757, meeting his death with calm resignation.

BYNKERSHOECK, CORNELIUS VAN, a Dutch lawyer, born at Middleburg in 1673. He studied at the University of Franeker, and after practising as a barrister at the Hague, became professor of law at Leyden, and president of the Council of Holland. He died in 1743. Bynkershoek was one of the most learned among modern civilians. His works were published at Geneva in 1761, and at Leyden in 1766. They are written in Latin; and his treatise *De Foro Legatorum Competente* was translated by Barbeyrac into French under the title of *Du Juge*

compétent des Ambassadeurs, 1738, 4to. Bynkershoek edited a periodical publication called *The New Mercury of the Hague*, which was suppressed owing to the offence taken at the strain of satire which it exhibited.

BYRGIVS, JUSTUS (properly *Jobst Bürgi*), a celebrated mechanist and astronomer, born at Lichtenstein in Switzerland in 1562, was invited to Cassel by the Landgrave of Hesse to superintend the observatory which he had there erected, and constructed a number of astronomical instruments, some curious clocks, and other machines. A discovery involving that of the logarithms, and another exhibiting an application of the pendulum to clocks, have been attributed to him. He is eulogized by Kepler for his talents, but censured for his indolence and undue reserve, which kept back his discoveries from the public. He died in 1632 or 1633.

BYRON, GEORGE GORDON NOEL, LORD BYRON, an English peer and poet of elevated genius, was born in Holles Street, London, Jan. 22, 1788. He was the grandson of Admiral John Byron (see next article), and son of the admiral's only son, Captain John Byron, of the Guards, notorious for his gallantry and reckless dissipation. By the eccentricity and misconduct of the old Lord Byron, and of the captain his nephew, the reputation of the family of Byron, so ancient and honourable in English history, had been considerably tarnished. The former was tried by his peers for killing his relation, Mr. Chaworth, in a combat with swords, after a tavern dispute, under circumstances so equivocal that he was indicted for murder, and made a very narrow escape from the penalty attendant upon man-slaughter—an escape which did not prevent him from being consigned, by public opinion, to a life of seclusion and obscurity. Captain Byron, the poet's father, was so dissipated that he obtained the name of the Mad Jack Byron. He was one of the handsomest men of his day, but so immersed in all the fashionable vices, that, at length, to be seen in his company was deemed discreditable. In his twenty-seventh year he seduced Amelia, marchioness of Carmarthen, daughter of the Earl of Holderness, to whom, on a divorce following, he was united in marriage. This seduction the ill-fated lady did not survive more than two years, when he took, for a second wife, Miss Catherine Gordon, heiress of Gight in Aberdeenshire, whose fortune he quickly all but dissipated, leaving her a widow in 1791, with a son, the celebrated subject of this article, then only three years of age. Previously to the death of her husband, having been deserted by him, Mrs. Byron retired with her infant son to her native place, Aberdeen, where she lived in seclusion on the ruins of her fortune. The circumstances attendant upon the early childhood of Byron seem to have operated materially in the formation of his very striking character. His mother was a woman of capricious temper, who at one time treated him with injudicious indulgence, at another with less excusable harshness, and some of the waywardness for which he was subsequently noted is undoubtedly to be traced to her unfortunate influence. Being of a sensitive nature, a slight malformation in both of his feet was felt by him as a galling defect, and his mother is even said to have taunted him with this deformity. To strengthen his constitution he was sent to various places in the country, including the neighbourhood of Ballater and the famous Lochnagar, where both scenery and legend combined to foster the poetical tendencies of the boy. From 1794 to 1798 he attended the grammar-school of Aberdeen, where he was more distinguished by his great occasional exertions, in order to make up for the intervals of absence rendered

necessary by his delicacy of health, than by his general application. In all boyish sports, however, the ardour of his temperament enabled him to surmount his natural disadvantages. In 1798 the death of his grand-uncle, without issue, gave him the titles and estates of the family; on which, being then ten years of age, he was removed from the immediate care of his mother, and placed under the guardianship of the Earl of Carlisle, who had married the sister of the late Lord Byron, a lady of considerable poetical abilities. On this change the youthful lord was placed at Harrow, where he distinguished himself more by his love of manly sports, and by his undaunted spirit, than by attention to his studies, or submission to school discipline; but although in a subsequent part of his life he indulged in some animadversions upon the tendency of the system in public schools, he always cherished an affectionate remembrance of Harrow, and of its master, Dr. Drury. While yet at school he fell deeply in love with Miss Chaworth, the daughter and heiress of a gentleman who had fallen by the hand of his grand-uncle, whom he met with on his occasional visits to Newstead. This lady, to whom he very beautifully alludes in a well-known poetical *Dream*, although some interviews and billets seem to have passed between them, ultimately married another and more mature suitor. This disappointment exceedingly wounded the ardent spirit of the youthful lover. When between sixteen and seventeen, he was entered of Trinity College, Cambridge; and here, as at Harrow, his dislike of discipline subjected him to much merited reproof, which he repaid with sarcasm and satire; and among other practical jokes, kept a bear, which, he observed, he was training up for a degree. At nineteen he quitted the university, and took up his residence at the family seat of Newstead Abbey, where he employed himself chiefly in amusement, and especially in aquatic sports and swimming. In 1807, while still at Newstead, he arranged his early productions, which he caused to be printed at Newark, under the title of *Hours of Idleness*, by George Noel Gordon Lord Byron, a Minor. These poems, although exhibiting some indication of the future poet, also betrayed several marks of juvenility and imitation, which induced the Edinburgh reviewers to indulge in an attack, much less distinguished for wit or acumen, than for unreasonable causticity and ill-nature. The ridicule produced by this critique roused the anger of the poet, who took revenge in his celebrated satire of *English Bards and Scotch Reviewers* (Mar. 1809). The spirit of resentment is seldom very just; and the anger, rather than the judgment of Byron, guided his pen on this occasion. It happened too, singularly enough, that, owing to party and other predilections, a number of the persons satirized in this poem, no long time after, were numbered among the friends of the author; for which reason, after it had passed through four editions, he suppressed it. It is unpleasant to relate that, about this time, Byron fell into a career of dissipation too prevalent among the youthful possessors of rank and fortune, when altogether uncontrolled. Thus his fortune became deeply involved before he had attained legal maturity, and his constitution much impaired by the excesses in which he spent it. This course of life, however, could not last, and in the year 1809 he determined to travel. Accordingly, in company with his fellow-collegian, John Cam Hobhouse, Esq., afterwards Lord Broughton (see *BRUGHOTON*), he embarked at Falmouth for Lisbon, and proceeded through the southern provinces of Spain to the Mediterranean. His subsequent peregrinations in Greece, Turkey, &c., need not be detailed here, having been rendered so famous by

his fine poem of *Childe Harold's Pilgrimage*. He returned home in June, 1811, after an absence of two years, and had not long arrived before he was summoned to Newstead, in consequence of the dangerous illness of his mother, who breathed her last before he could reach her.

In 1812 Byron gave to the world the first two cantos of *Childe Harold's Pilgrimage*. This assumption of the character of a wayward libertine, satiated by an over-cultivation of pleasure into misanthropy, tedium, and listlessness, and that in such a manner that the application would necessarily be made to himself, afforded proof both of the perverted feeling and of the originality of Byron. There was, however, a boldness in the repulsive personification, and a force and an energy in the mode of supporting it, so indicative of great powers, that it at once produced a strong impression. Eulogy now flowed in from all quarters. Even the readers who disapproved of the misanthropy and sombre views of human nature displayed in this extraordinary production, confessed its genius. Thus the feelings of admiration became general, and the strong current of fashion turning directly in his favour, his acquaintance was widely, not to say universally, courted; and his first entry on the stage of public life may be dated from this era. Nor were the manners, person, and conversation of Byron of a nature to dissipate the charm with which his talents had invested him. Although easy and affable in his general manners, the latent reserve of conscious genius was always observable; added to which, the associations connected with his identification with his own *Childe Harold* excited a mysterious and undefinable curiosity. Even his physiognomy was eminently calculated to keep up the interest which he otherwise inspired; the predominating expression of his fine features being that of deep and habitual thought, although, when engaged in interesting discussion, they as forcibly exhibited gaiety, indignation, and satire. Thus, in the imitative world of fashion, the enthusiastic looked on him to admire, the serious to admonish, and the soft with a desire to console. The latter sympathy he excited too powerfully in certain quarters, and a course of noxious intrigue was the consequence. It is more gratifying to observe that, in the midst of all this licence, he was capable of delicate and generous actions, of which a number of well-authenticated instances are on record. The quick and scrutinizing manners which he had cast on eastern character and manners was now manifested in the *Giaour*, the *Bride of Abydos*, the *Corsair* (the copyright of which, as well as that of *Childe Harold*, he gave to Mr. Dallas), *Lara*, and the *Siege of Corinth*, which followed one another in quick succession, in the course of the two years 1813 and 1814. For parliamentary duties he seems to have had a decided distaste, and it was not until his return from the Continent that he ventured to speak. He made his maiden speech in February, 1812, from the opposition bench, against the *Frame-work Bill*, and was argumentative and lively, if not very original. Having now become a character whose support might be of considerable consequence, he was congratulated accordingly. Another time he addressed the house in support of Catholic Emancipation, and a third and last time on presenting a petition from Major Cartwright.

On the 2d of January, 1815, Byron married Anna Isabella, the only daughter of Sir Ralph Milbanke. Their married life had not lasted long when it was disturbed by pecuniary embarrassments, in consequence of which it was settled that Lady Byron, who had presented his lordship with a daughter on the 10th of December, should return to her parents until better arrangements could be made. From this visit

Lady Byron ultimately refused to return, and a formal separation ensued. The real reason of Lady Byron's separation from her husband is still uncertain; for the reason which Mrs. Stowe laid before the public in 1869, alleging it to be the real one as stated by Lady Byron herself, seems inconsistent with the circumstances of the case, and with Lady Byron's own conduct. This rupture produced a considerable sensation in the world of fashion, and the most contradictory rumours prevailed, in the midst of which Byron left England, with an expressed resolution never to return. He visited France, the field of Waterloo and Brussels, the banks of the Rhine, Switzerland, and the N. of Italy, and for some time took up his abode at Venice. Here he was joined by Mr. Hobhouse, who accompanied him on a visit to Rome, where he completed his third canto of *Childe Harold*. Not long after appeared the *Prisoner of Chillon*, a *Dream*, and other Poems; and in 1817 *Manfred*, a tragedy, and the *Lament of Tasso*. In one of his excursions from Italy he resided for some time at Abydos, and thence proceeded to Tenedos and the Island of Scio, where he likewise stayed three months, during which time he visited every classical scene, and frequently slept in the peasants' cottages, to whom his liberality made him a welcome guest. He also visited several other islands, and at length repaired to Athens, where he sketched many of the scenes of the fourth and last canto of *Childe Harold*, which poem was published in 1818, and sustained the high reputation of the author. In the same year appeared the *jeu d'esprit* of *Beppo*, in the mixed and pointed manner of the Italian style of poetical humour, and marked by a tone of loose morality, which ripened into licentiousness in *Don Juan*. In 1819 was published the romantic tale of *Mazeppa*, and the same year was marked by the commencement of *Don Juan*, which his bookseller, Mr. Murray, declined openly to publish. Of this celebrated production it is as vain to deny the profligacy as the genius. In 1820 was published *Marino Faliero*, Doge of Venice, a tragedy, written with an avowed attention to the exploded system of the dramatic unities, which too frequently subtracts from the interest all that it gives to more cold and classical qualities; nor did this effort of Byron's prove an exception. The next year he addressed a letter to Mr. W. Lisle Bowles, in defence of the poetical character of Pope, which had been rated very low in that writer's life of him. This dispute arose out of a disposition, in certain critics, to ground poetical character exclusively on a tendency to deal with the primary associations connected with natural objects and affections, rather than on the more complex and factitious combinations produced by art and cultivation. This school not unfrequently pushes its theory to an extreme, as in the case of Pope, whom Byron, on the other hand, may have somewhat hyperbolically exalted. In the same year appeared the drama of *Sardanapalus*, indisputably the finest of his tragic offspring; the *Two Foscari*, a tragedy; and *Cain*, a mystery. The last is a production of much power, but marked by the same rashness of speculation and recklessness of moral effect which disfigure many of the author's productions.

After leaving Venice Byron resided for some time at Ravenna, then at Pisa, and lastly at Genoa. At Ravenna he became intimate with the Countess Guiccioli, a married lady; and when he removed to Pisa she followed him. Here they both lived together openly in the Lanfranchi Palace. It was at Pisa that in 1822, in conjunction with Leigh Hunt, who, on invitation, had become his guest, and Percy Bysshe Shelley, the periodical publication

called the *Liberal* was commenced, which, principally owing to the unhappy fate of Shelley (who perished by the upsetting of a boat in the Mediterranean), extended only to four numbers. In this work first appeared the *Vision of Judgment*, caused by the singularly ill-judged performance, under the same title, of Southey. The publisher was prosecuted, and fined £100. Heaven and Earth, a mystery, also first appeared in the *Liberal*. It is founded on the supposed intercourse between angels and the daughters of earth before the flood, and possesses great force and beauty. The later cantos of *Don Juan*, with *Werner*, a tragedy, and the *Deformed Transformed*, a fragment, bring up the rear of Byron's performances. In the autumn of 1822 he quitted Pisa, and wintered at Genoa, and now began to indulge those feelings, in regard to the efforts of the Greeks to throw off the Mohammedan yoke, which determined him to lend them the aid of his person, purse, and influence. It would also appear by some noble verses which have been printed since his death, that a secret consciousness of his career of action having too long been unworthy of him, induced him to seek a nobler species of distinction than one of mere self-engrossment and successful gallantry. It is unnecessary to dwell upon the general tendency of powerful minds, at a particular stage of existence, to break from the enthrallments of pleasure and the senses, because it has been the great theme of allegory ever since allegory was invented. In addition to being satiated with the usual enjoyments of a dissipated man of rank, and disgusted with the sameness of commonplace life, many circumstances contributed to render Byron an enthusiast for Greece. In common with many more, the associations connected with its illustrious history doubtless served to stimulate his concern for its modern degradation; but in him these feelings were quickened by an acquaintance with its grand and beautiful scenery, its various races of wild and picturesque manners, and by the personal interest which he had already excited there. Whatever may have been the exact combination of motive, in August, 1822, he embarked, accompanied by five or six friends, in a British vessel, which he had hired for the purpose, and arrived at the commencement of the third campaign. He established himself some time in Cephalonia, and despatched his friends, Messrs. Trevelyan and Hamilton Brown, with a letter to the Greek government. The result of their information induced him to advance £12,000 for the relief of Missolonghi. The dissensions among the Greeks gave him great pain, and involved him in considerable difficulties. At length he sailed from Argostoli with two Ionian vessels, and, taking considerable specie on board, proceeded to Missolonghi, where, after considerable hazard and danger, and the loss of one of his vessels, he finally arrived, and was received with every mark of honour Grecian gratitude could devise. His influence was immediately exerted in the mitigation of the ferocity with which the war was waged on the part of the Greeks; but it was much more difficult to produce union among their leaders. He immediately began to form a brigade of Sulistat, 500 of whom were taken into his pay, with a view to an expedition against Lepanto; but such was the disorderly and unsettled temper of these troops, that he was obliged to postpone it. This unexpected disappointment preyed on his spirits, and, Feb. 15, he was attacked with a severe fit of epilepsy. He had, subsequently, other attacks, but at length the violence of the disorder began to yield to the skill of his physician, and he was recommended to remove for a while from the flat, marshy, and unhealthy site of Missolonghi, to Zante. This step, with his usual

tenacity, he refused to take. 'I cannot quit Greece (he wrote to a friend) while there is a chance of my being even of supposed utility. There is a stake worth millions such as I am, and while I can stand at all I must stand by the cause. While I say this, I am aware of the difficulties, dissensions, and defects of the Greeks themselves; but allowance must be made for them by all reasonable people.' On the expedition against Lepanto being given up, other projects were proposed with reference both to military operations and to congresses for uniting Eastern and Western Greece; but, unhappily, the fatal moment was at hand which was to deprive the Greek cause of its firm and energetic friend. On the 9th of April, Byron, while riding out, got extremely wet; and, scarcely recovered from the effects of his former disorder, a fever ensued, which, it is thought, might have yielded to copious bleeding in the first instance, but which, owing either to his own objection or the inaccurate opinion of the physician of the nature of the disease, was destined to prove fatal on the evening of the 19th of April, 1824. During his illness some fine traits of humanity and feeling for his attendants were exhibited by Byron, and nearly his last words, previous to sinking into the lethargy which ended in death, were, 'My wife, my child, my sister!—you know all—you must say all.' His utterance then failed him, as it had previously done in referring to the same near connections.

Thus, in his thirty-seventh year, prematurely died this extraordinary genius, to the deep affliction of the people whose cause he had espoused, who decreed every possible public testimony of their sorrow. Nor was his death a subject of less regret to many who looked for a noble recompense in the maturity of his life for the faults of his commencement and subsequent progress. Many of his errors were evidently the result of a too early release from all discipline and control, and the neglect which family circumstances had thrown round him. In other respects, the vices and fallings of Byron, undeniable, it is true, were much magnified by the peculiarity of his genius and character, which attracted an intensity of observation to all which concerned him. The disposition of the public at once to admire and condemn, accompanied as it was with an involuntary tendency to confound the character of the poet with some of the most romantic creations of his imagination, however it might annoy him in the first instance, in the sequel too obviously nurtured a degree of personal vanity, which formed one of the greatest weaknesses of his character. Commonplace censure produces little effect when coupled with great admiration, and still less is effected by the virulence of party attack, or by direct personal hostility. The morals of Byron, on the score of gallantry, his carelessness of female reputation, and hasty and vindictive spirit of resentment, are altogether indefensible; but it is certain that they were mixed up with great humanity, benevolence, and generosity. It was evident, too, from his death, and many other circumstances, that, whatever his pride and resentment at being so decisively abandoned, he nurtured the natural feelings of a husband and father deep in his bosom. In respect to several disputed points of his conduct, the Memoirs, by himself (which he gave to Moore to raise a loan from Murray, the bookseller, and which that gentleman, at the instance of his family, thought proper to destroy), would doubtless have given much information to the world. As it is, certain journals of visitors, and of temporary companions, professing to record his conversation, but poorly supply their place. The body of Byron was brought to England, and lay in state in London. It was subsequently interred near his own seat of Newstead Abbey,

where a plain marble slab merely records his name and title, date of death, and age. Besides his only legitimate child and heiress, Byron left another daughter in Italy; to whom he bequeathed £5000, on the condition of her not marrying an Englishman. The successor to his estate and title was his cousin, Captain George Anson Byron, of the royal navy.

BYRON, JOHN, an English commodore, was born in the year 1723, and embarked, at the age of seventeen, in one of the ships of Lord Anson, which was fitted out for a voyage round the world, but was wrecked on the coast of the Pacific, N. of the Straits of Magellan. Byron, with some of his unfortunate companions, was conducted by the Indians to Chili, and remained there till 1744, when he embarked on board a ship of St. Malo, and in 1745 returned to Europe. At a subsequent period he published a Narrative of his adventures, which is extremely interesting. In 1758 he commanded three ships of the line, and distinguished himself in the war against France. George III., who wished to explore the part of the Atlantic Ocean between the Cape of Good Hope and the southern part of America, gave Byron the command of a frigate, with which he set sail, June, 1764. After having circumnavigated the globe, he returned at the end of two years to England, where he arrived in May, 1766. Although Byron's voyage was not fruitful in discoveries, it still deserves an honourable place in the history of voyages round the world, since he was the first of those renowned circumnavigators of the globe, including Wallis, Cartoret, and Cook, whose enterprises were not merely mercantile, but were directed to scientific objects. In 1769 Commodore Byron was appointed to the government of Newfoundland, which he held till 1775. He was raised to the rank of vice-admiral of the white in 1779, and died in 1786. Such was his general ill fortune at sea, that he was called by the sailors 'Foul-weather Jack.'

BYRON ISLAND, a small island in the Pacific, about 12 miles in length, abounding in cocoa-nuts. It was discovered by Commodore Byron in 1785. Like the other Gilbert Islands it belongs to Britain.

BYSSUS, a kind of fine flax and the linen made from it, was used in India and likewise in Egypt at a very early date. In this latter country it was used in embalming, and the mummies are still found wrapped in it. As an article of dress it was worn only by the rich. Dives, in Christ's parable (Luke xvi. 19), was clothed in byssus, and it is mentioned among the riches of fallen Babylon (Rev. xviii. 12). Byssus was formerly erroneously considered as a fine kind of cotton. The fine stuff manufactured from the byssus is called more particularly *sindon*. Foster derives the word *byssus* from the Coptic. Byssus was also used by the ancients, and is still used, to signify the hair or thread-like substance (called beard), with which the different kinds of sea-mussels fasten themselves to the rocks. The *Pinna marina*, particularly, is distinguished by the length and the silky fineness of its beard, from which very durable cloths, gloves, and stockings are still manufactured in Sicily and Calabria; but these are produced mainly as curiosities.

BYTTNERIACEÆ (or more properly BÜTTNERIACEÆ, since the typical genus of this order was dedicated to, and named after the botanist Büttner), a nat. order of exogenous plants, with the following characteristics. The members of this order are trees or shrubs, with simple alternate leaves, and opposite stipules; flowers disposed in clusters, which are axillary or opposite to the leaves; calyx and corolla with five divisions, but the latter sometimes wanting; stamens of the same number as the petals, or double or multiple, in general monadelphous; anthers always

two-celled; carpels, from three to five in number, more or less completely united, each cell with two or three ascending ovules or a greater number; styles free, or more or less united; fruit generally a globose capsule dehiscent or indehiscent. This order is distinguished from the Malvaceæ by its two-celled anthers, and by the fact that its seeds are generally furnished with a fleshy endosperm. The order is divided into six sub-orders, one of which takes its name from the genus *Byttneria*, which gives its name to the whole order. The chief genus of this sub-order is *Theobroma cacao*, from the seeds of which cocoa is prepared. The genus *Guazuma*, a native of Brazil, belonging to the same sub-order, is cultivated for the sake of its fruit, which is edible, and filled with a sweet and pleasant mucilage. Another genus of this sub-order, namely, *Abroma*, is valuable on account of its fibre, from which strong cordage is manufactured. The genus *Astrophea* is said to contain the most beautiful plants: all the species are remarkable for the mucilage they contain.

BYZANTINE EMPIRE. The Byzantine or Eastern Roman Empire comprehended at first in Asia the country on this side of the Euphrates, the coasts of the Black Sea, and Asia Minor; in Africa, Egypt; and in Europe, all the countries from the Hellespont to the Adriatic and the Danube. This survived the Western Empire 1000 years, and was even increased by the addition of Italy and the coasts of the Mediterranean. It commenced in 395, when Theodosius divided the Roman empire between his two sons Arcadius and Honorius. The Eastern Empire fell to the elder, Arcadius, through whose weakness it suffered many misfortunes. During his minority Rufinus was his guardian and minister, between whom and Stilicho, the minister of the Western Empire, a fierce rivalry existed. The Goths laid waste Greece. Eutropius, the successor, and Gainas, the murderer of Rufinus, were ruined by their own crimes. The latter lost his life in a civil war excited by him (400). Arcadius and his empire were now ruled by his proud and covetous wife Eudoxia, till her death (404). The Isaurians and the Huns wasted the provinces of Asia and the country along the Danube. Theodosius the Younger succeeded his father (408), under the guardianship of his sister Pulcheria. Naturally of an inferior mind, his education had made him entirely imbecile and unfit for self-command. Pulcheria, who bore the title of *Augusta*, administered the kingdom ably. Of the Western Empire, which had been ceded to Valentinian, Theodosius seized upon West Illyria (423). The Greeks fought with success against the King of the Persians, Varanes. The kingdom of Armenia, thrown into confusion by internal dissensions, and claimed at the same time by the Romans and the Persians, became now a bone of contention between the two nations (440). Attila laid waste the dominions of Theodosius, and obliged him to pay tribute (447). After the death of her brother Pulcheria was acknowledged empress (450). She was the first female who attained this dignity. She gave her hand to the senator Marcian, and raised him to the throne. His wisdom and valour averted the attacks of the Huns from the frontiers, but he did not support the Western Empire in its wars against the Huns and the Vandals with sufficient energy. He afforded shelter to a part of the Germans and Sarmatians who were driven to the Roman frontiers by the incursions of the Huns. Pulcheria died before him in 453. Leo I. (457), a prince praised by contemporary authors, was chosen successor of Marcian. His expeditions against the Vandals (467) were unsuccessful. His grandson Leo II. succeeded, but survived only a few months, when Zeno, the father

of Leo, who had previously been appointed his colleague, became sole emperor (474). The government of this weak emperor, who was hated by his subjects, was disturbed by rebellions and internal disorders of the empire. The Goths depopulated the provinces till their king Theodoric turned his arms against Italy (489). Ariadne, widow of Zeno, raised the minister Anastasius, whom she married, to the throne (491). The nation, once excited to discontent and tumults, could not be entirely appeased by the alleviation of their burdens and by wise decrees. The forces of the empire, being thus weakened, could not offer an effectual resistance to the Persians and the Bulgarians along the Danube. To prevent their incursions into the peninsula of Constantinople, Anastasius built the *long wall*, as it is called. After the death of Anastasius the soldiers proclaimed Justin emperor (527). Notwithstanding his low birth he maintained possession of the throne. Religious persecutions which he undertook at the instigation of the clergy and various crimes, into which he was seduced by his nephew Justinian, disgrace his reign. After his own death, in 527, he was succeeded by the same Justinian (which see), to whom, though he deserves not the name of the *Great*, many virtues of a ruler cannot be denied. He was renowned as a legislator, and his reign was distinguished by the victories of his general Belisarius, but how unable he was to revive the strength of his empire, was proved by its rapid decay after his death. Justin II., his successor (565), was an avaricious, cruel, weak prince, governed by his wife. The Longobardi (Lombards) tore from him part of Italy (568). His war with Persia, for the possession of Armenia (570), was unsuccessful; the Avari plundered the provinces on the Danube, and the violence of his grief at these misfortunes deprived him of reason. Tiberius, his minister, a man of merit, was declared Cæsar, and the general, Justinian, conducted the war against Persia with success. The Greeks now allied themselves, for the first time, with the Turks. Against his successor, Tiberius II. (578), the Empress Sophia and the General Justinian conspired in vain. From the Avari the emperor purchased peace; from the Persians it was extorted by his General Mauritius or Maurice (582), who, after the death of Tiberius in the same year, was declared his successor. Mauritius, under other circumstances, would have made an excellent monarch, but, for the times, he wanted prudence and resolution. He was indebted for the tranquillity of the eastern frontiers to the gratitude of King Chosroes II., whom, in 591, he restored to the throne, from which he had been deposed by his subjects. Nevertheless, the war against the Avari was unsuccessful, through the errors of Comnenianus. The army was discontented, and was irritated now by untimely severity and parsimony, and now by timid indulgence. They finally proclaimed Phocas, one of their officers, emperor. Mauritius was taken in his flight and put to death (602). The vices of Phocas and his incapacity for government produced the greatest disorder in the empire. Heraclius, son of the governor of Africa, took up arms, conquered Constantinople, and caused Phocas to be executed (610). He distinguished himself only in the short period of the Persian war. During the first twelve years of his reign he the Avari, and other nations of the Danube, plundered the European provinces, and the Persians conquered the coasts of Syria and Egypt. Having finally succeeded in pacifying the Avari, he marched against the Persians (622), and defeated them; but during this time the Avari, who had renewed the war, made an unsuccessful attack on Constantinople in 626. Taking advantage of an insurrection of the subjects of Chos-

room, he penetrated into the centre of Persia. By the peace concluded with Siroes (629), he recovered the lost provinces and the holy cross. But the Arabians, who now became powerful under Mohammed and the caliphs, conquered Phenicia, the countries on the Euphrates, Judea, Syria, and all Egypt (635-641). Among his descendants there was not one able prince. He was succeeded by his son Constantine III., probably in conjunction with his step-brother Heraclonas (641). The former soon died, and the latter lost his crown in a rebellion, and was mutilated. After him Constans, son of Constantine, obtained the throne (642). His sanguinary spirit of persecution, and the murder of his brother Theodosius (650), made him odious to the nation. The Arabians, pursuing their conquests, took from him part of Africa, Cyprus, and Rhodes, and defeated him even at sea (658). Internal disturbances obliged him to make peace. After this he left Constantinople, and in 663 began an unsuccessful war against the Lombards in Italy. He died at Syracuse in 668. Constantine IV., Pogonatus, son of Constans, vanquished his Syracusan competitor Mezentius, and, in the beginning of his reign, shared the government with his brothers Tiberius and Heraclius. During the early part of his reign the Arabians inundated all Africa and Sicily, penetrated through Asia Minor into Thrace, and attacked Constantinople, for several successive years, by sea. Nevertheless, he made peace with them on favourable terms. But on the other hand, the Bulgarians obliged him to pay a tribute (680). Justinian II., his son, who succeeded him in 685, weakened the power of the Maronites, but fought without success against the Bulgarians and against the Arabians. Leontius dethroned this cruel prince, and after mutilating, banished him to the Tauric Cheroneus (695). Leontius was dethroned by Apisimar, or Tiberius III. (698), who was dethroned by Trebelius, king of the Bulgarians, who restored Justinian (705); but Philippius Bardanes rebelled anew. With Justinian II. the race of Heraclius was extinguished. The only care of Philippius was the spreading of Monothelism, whilst the Arabians wasted Asia Minor and Thrace. Philippius reigned from 711 to 713, when he was deposed by Anastasius, who at the end of three years retired to a monastery, the army sent out against the Arabians having revolted against him, and proclaimed their leader, Theodosius, emperor. This prince, known as Theodosius III., after a reign of only fourteen months, was compelled in his turn to yield the throne to Leo the Isaurian, general of the army of the East, who refused to recognize him, and marched against Constantinople (May, 717). Leo repelled the Arabians from Constantinople, which they had attacked for almost two years, and suppressed the rebellion excited by Basilus and the former emperor Anastasius. From 726 the abolition of the worship of images absorbed his attention, and the Italian provinces were allowed to become a prey to the Lombards, who thus put an end to the exarchate of Ravenna (728), while the Arabians plundered the eastern provinces. After his death (741), his son Constantine V. ascended the throne—a courageous, active, and noble prince. He vanquished his rebellious brother-in-law Artabastus, wrested from the Arabians part of Syria and Armenia, and overcame at last the Bulgarians, against whom he had been long unsuccessful. He died (775), and was succeeded by his son Leo IV., who fought successfully against the Arabians, and this latter by his son Constantine VI. (780), whose imperious mother, Irene, his guardian and associate in the government, raised a powerful party by the restoration of the worship of images. He endeavoured, in vain, to free himself from the dependence on her and her favourite, Stau-

ratius, and died in 787, after having had his eyes put out. The war against the Arabians and Bulgarians was long continued; against the first it was unsuccessful. The design of the empress to marry Charlemagne excited the discontent of the patricians, who placed one of their own order, Nicephorus, upon the throne (802). Irene died in a monastery. Nicephorus became tributary to the Arabians, and fell in the war against the Bulgarians (811). Stauratius, his son, was deprived of the crown by Michael I., and he, in turn, by Leo V. (813). Leo was dethroned and put to death by Michael II. (820). During the reign of the latter the Arabians conquered Sicily, Lower Italy, Crete, and other countries. He prohibited the worship of images, as did also his son Theophilus (829-42). Theodora, widow of Theophilus and guardian of his son Michael III., put a stop to the dispute about images (842). During a cruel persecution of the Paulicians, considered to be an offshoot of the Manichæans, the Arabians devastated the Asiatic provinces. The dissolute and extravagant Michael confined his mother in a monastery. The government was administered in his name by Bardas, his uncle, and after the death of Bardas by Basil, by whom Michael was put to death (867). Basil I., who came to the throne in 867, was not altogether a contemptible monarch. He died 886. The reign of his learned son, Leo VI. (the Philosopher), was not very happy. He died 911. His son, Constantine VII., Porphyrogenitus (that is, 'born in the purple'), a minor when he succeeded his father, was placed under the guardianship of his colleague, Alexander, and after Alexander's death, in 912, under that of his mother Zoe. Romanus Lecapenus, his general, obliged him in 919, to share the throne with him and his children, Constantine VIII. and Stephanus. Constantine subsequently took sole possession of it again, and reigned mildly, but weakly. His son, Romanus II., succeeded him in 959, and fought successfully against the Arabians. To him succeeded, in 963, his general Nicephorus II. (Phocas), who was put to death by his own general, John Zimisceus (969), who carried on a successful war against the Russians. Basil II., son of Romanus, succeeded this good prince in 976. He vanquished the Bulgarians and the Arabians. His brother, Constantine IX. (1025), was not equal to him. Romanus III. became emperor (1028) by a marriage with Zoe, daughter of Constantine. This dissolute but able prince caused her husband to be executed, and successively raised to the throne Michael IV. (1034), Michael V. (1041), and Constantine X. (1042). Russians and Arabians meanwhile devastated his empire. Her sister Theodora succeeded her on the throne (1054). Her successor, Michael VI. (1056), was dethroned by Isaac Comnenus in 1067, who became a monk (1059). His successor, Constantine XI., Duca, fought successfully against the Uzes. Eudocia his wife, guardian of his sons, Michael, Andronicus, and Constantine, was intrusted with the administration (1067), married Romanus IV., and brought him the crown. He carried on an unsuccessful war against the Turks, who kept him for some time prisoner. Michael VII., son of Constantine, deprived him of the throne (1071). Michael was dethroned by Nicephorus III. (1078), and the latter by Alexius I. Comnenus (1081). Under his reign the Crusades commenced. His son, John II., came to the throne (1118), and fought with great success against the Turks and other barbarians. The reign of his son, Manuel I., who succeeded him (1143), was also not unfortunate. His son, Alexius II., succeeded (1180), and was dethroned by his guardian, Andronicus (1183), as was the latter by Isaac (1185). After a reign disturbed from without and within, Isaac was dethroned by his brother, Alexius III. (1195). The Crusaders restored

him and his son, Alexis IV.; but the seditious Constantinopolitans proclaimed Alexis V., Duca Murzuphius, emperor, who put Alexis IV. to death. At the same time Isaac II. died. During the last reigns the Kings of Sicily had made many conquests on the coasts of the Adriatic. The Latins now forced their way to Constantinople (1204), conquered the city, and retained it, together with most of the European territories of the empire. Baldwin, count of Flanders, was made emperor; Boniface, marquis of Montferrat, obtained Thessalonica as a kingdom, and the Venetians acquired a large extent of territory. In Attalia, Rhodes, Philadelphia, Corinth, and Epirus, independent sovereigns arose. Theodore Lascaris seized on the Asiatic provinces, in 1206 made Nice (Nicaea) the capital of the empire, and was at first more powerful than Baldwin. In 1204 a descendant of the Comneni, named Alexis, established a principality at Trebizond, in which his great-grandson John took the title of emperor. Neither Baldwin nor his successors were able to secure the tottering throne. He himself died in captivity among the Bulgarians (1206). He was followed first by Henry, his brother, then by Peter, brother-in-law of Henry (1217), and then by Robert of Courtenay, son of Peter, who succeeded in 1219, but was not crowned till 1221. With the exception of Constantinople, all the remaining Byzantine territory, including Thessalonica, was conquered by John, emperor of Nice. Baldwin II., brother of Robert, succeeded and reigned under the guardianship of his colleague, John of Brienne, king of Jerusalem, till 1237, after which he was sole ruler till 1261. In that year Michael Paleologus, king of Nice, conquered Constantinople, and Baldwin died in the West, a private person. The sovereigns of Nice up to this period were Theodore Lascaris (1206); John Duca Vatazes, a good monarch and successful warrior (1222); Theodore II., his son (1254); John Lascaris (1259), who was deprived of the crown by Michael Paleologus in Dec. 1259, who himself received the crown Jan. 1, 1260. In 1261 Michael took Constantinople from the Latins. He laboured to unite himself with the Latin Church, but his son, Andronicus II. (1282), renounced the connection. Internal disturbances and foreign wars, particularly with the Turks, threw the exhausted empire into confusion. Andronicus III., his grandson, obliged him to divide the throne, and at length wrested it entirely from him (1328). He waged war unsuccessfully against the Turks, and died in 1341. His son, John Paleologus, was obliged to share the throne with his guardian, John Cantacuzene, during the first years of his reign. The son of the latter, Matthew, was also made emperor. But John Cantacuzene resigned the crown, and Matthew was compelled to abdicate (1355), when John Paleologus, the son of Andronicus III., became sole emperor. Under his reign the Turks first obtained a firm footing in Europe, and conquered Gallipoli (1357). The family of Paleologus from this time were gradually deprived of their European territories, partly by revolt, partly by the Turks. The Sultan Amurath took Adrianople (1361). Bajazet conquered almost all the European provinces except Constantinople, and obliged John to pay him tribute. The latter was, some time after, driven out by his own son, Andronicus, who was succeeded by his second son, Manuel (1391). Bajazet besieged Constantinople, defeated an army of western warriors under Sigismund, king of Hungary, near Nicopolis (1396), and Manuel was obliged to place John, son of Andronicus, on the throne. Timur's invasion of the Turkish provinces saved Constantinople for this time (1402). Manuel then recovered his throne, and regained some of the lost provinces from the contending sons of Bajazet. To him succeeded his son John, Paleolo-

gus II. (1425), whom Amurath II. stripped of all his territories except Constantinople, and laid under tribute (1444). To the Emperor John succeeded his brother Constantine Paleologus. With the assistance of his general, Justinian, a Genoese, he withstood the superior forces of the enemy with fruitless courage, and fell in the defence of Constantinople, by the conquest of which (May 29, 1453) Mohammed II. put an end to the Greek or Byzantine Empire. In 1461 David Comnenus, emperor of Trebizond, submitted to him, and at a subsequent period was put to death. See COMNENI.

Byzantine Literature - The Greek literature of the period of the Byzantine Empire is almost entirely destitute of originality, and derives importance almost entirely from the mass of valuable historical material embodied in it. Among the historians proper the more notable are Procopius of Caesarea; Agathangos, who wrote an account of Justinian's reign; Nicephorus Gregoras; Anna Comnena, daughter of the Emperor Alexis I., author of a highly laudatory life of her father; Pachymerus; George Comnenus, Constantine VII., Porphyrogenitus, from whom we have many works on history, law, politics, and science; John Cantacuzenus, emperor and historian; and at the very end of the period, M. Duca. Poetry, in the proper sense of the word, can scarcely be said to have existed at all. Theocritus Prodrromus, who flourished in the later twelfth century, is the chief of the versifiers, among his works being a long romance having Rhodantia and Doskias as its heroine and hero, some dramas, historical poems epistles, &c. Georgios of Poidia, in the early seventh century, wrote war poems; Nicetas Eugenianus, a contemporary of Prodrromus, wrote a work in imitation of the latter's romances, and among other writers of verse were Theodosius, of the latter half of the tenth century, Tzetzes and Joannes Padiasimus, the latter two being better known as annotators of the Greek classical writers. Manuel Philos of Ephesus (about 1280-1330) has left many dramas; and we have hymns from Germanus, a patriarch of Constantinople; Theodorus Studites; Porphyrogenitus; Cosmas, an eighth-century writer; Joannes Damascenus (John of Damascus); and Theophanes Ho Graptos. Among writers of grammatical and similar works the most notable are Tzetzes (c. 1180), who annotated Homer, Hesiod, Aeschylus, and especially Aristophanes; Eustathius, archbishop of Myra in Lycia in 1174, best known for his commentary on Homer; Manuel Moschopoulos, a thirteenth-century scholiast; Joannes Padiasimus, of the latter part of the fourteenth century, chiefly known for his scholia on Hesiod's poems; and Demetrius Triclinius, a scholiast contemporary with Padiasimus. Their work is less valuable in itself than as a link with the more reliable work of their predecessors, or as containing much that would, but for them, have been lost to us. Of the lexicographers Suidas, who lived during the tenth century, is much the most important; but the works of Photius in this department are also of value. Joannes Doxopater, of the later eleventh century, wrote on rhetoric; and in the department of philology we find the names of Michael Bellus the younger (about 1018-1105), who also wrote historical and other works, and Joannes Italus. The theologians include Joannes Damascenus, already mentioned, author of *Sacra Parallela*, a collection of passages from the fathers; and Nicephorus Callistus, a fourteenth-century writer on ecclesiastical history.

Byzantine Art, the style which prevailed in the Byzantine Empire, and which arose after Constantine the Great had made Byzantium the capital of the

Roman Empire (330 A.D.), and had ornamented that city, which was renamed after him, with all the treasures of Grecian art. (See CONSTANTINE.) One of the chief influences in Byzantine art was Christianity, and to a certain extent Byzantine art may be recognized as the endeavour to give expression to the new elements which Christianity had brought into the life of men. The tendency towards Oriental luxuriance and splendour of ornament now quite supplanted the simplicity of ancient taste. Richness of material and decoration was the aim of the artist rather than purity of conception. Yet the classical ideals of art, and in particular the traditions of technical processes and methods carried to Byzantium by the artists of the Western Empire, held their ground long enough, and produced work pure and powerful enough, to kindle the new artistic life which began in Italy with Cimabue and Giotto.

With regard to *sculpture* the statues no longer displayed the freedom and dignity of ancient art. The true proportion of parts, the correctness of the outlines, and in general the severe beauty of the naked figure, or of simple drapery in Greek art, were neglected for extravagant costume and ornamentation and petty details. Yet in the best period of Byzantine art, from the sixth to the eleventh century, there is considerable spiritual dignity in the general conception of the figures. But sculpture was of second-rate importance at Byzantium, the taste of those times inclining more to mosaic work with the costliness and brilliant colours of its stones. The first germ of a Christian style of art was developed in the Byzantine pictures. The artists, who appear to have seldom employed the living model, and had nothing real and material before them, but were obliged to find, in their own imaginations conceptions of the external appearance of sacred persons, such as the mother of Christ or the apostles, could give but feeble renderings of their ideas. As they cared but little for a faithful imitation of nature, but were satisfied with repeating what was once acknowledged as successful, it is not strange that certain forms, approved by the taste of the time, should be made, by convention, and without regard to truth and beauty, general models of the human figure, and be transmitted as such to succeeding times. In this way the artists in the later periods did not even aim at accuracy of representation, but were contented with stiff general outlines, lavishing their labour on ornamental parts.

Byzantine *architecture* may be said to have assumed its distinctive features in the church of St. Sophia built by Justinian in the sixth century, and still existing as the chief mosque in Constantinople. It is more especially the style associated with the Greek Church as distinguished from the Roman. The leading forms of the Byzantine style are the round arch, the circle, and in particular the dome. The last is the most conspicuous and characteristic object in Byzantine buildings, and the free and full employment of it was arrived at when by the use of pendentives the architects were enabled to place it on a square apartment instead of a circular or polygonal. In this style of building incrustation, the incrustation of brick with more precious materials, was largely in use. It depended much on colour and surface ornament for its effect, and with this intent mosaics wrought on grounds of gold or of positive colour are profusely introduced, while col-

oured marbles and stones of various kinds are greatly made use of. The capitals are of peculiar and original design, the most characteristic being square and tapering downwards, and they are very varied in their decorations. Byzantine architecture may be divided into an older and a newer (or Neo-Byzantine) style. The most distinctive feature of the latter is that the dome is raised on a perpendicular circular or polygonal piece of masonry (technically the *drum*) containing windows for lighting the interior, while in the older style the light was admitted by openings in the dome itself. The Byzantine style had a great influence on the architecture of Western Europe, especially in Italy, where St. Mark's in Venice is a magnificent example, as also in Sicily. It had also material influence in Southern France and Western Germany.

BYZANTIUM, the name of the city of Constantinople before its name was changed by Constantine the Great. It was founded by a colony of Greeks from Megara, who, under a leader named Byzas, settled on what seemed a favourable spot at the entrance to the Thracian Bosphorus, in 658 B.C. The city which was built by the first colonists was named after their leader. Other colonists followed from different quarters, especially from Miletus, and Byzantium was already a flourishing town when it was taken and sacked by the Persians, in the reign of Darius, the son of Hystaspes. After the retreat of the Persians (B.C. 478) Byzantium soon recovered itself. During the Peloponnesian war it acknowledged for some time the supremacy of the Athenians, but afterwards fell away. Alcibiades recovered it for Athens (409), but it was taken by Lysander in 405. At a later period the Byzantines received support from Athens in their resistance against Philip of Macedon. The barbarian Thracians, who occupied the neighbouring territory, and the Celts (Galatians), in their migrations to the East, often appeared to threaten the safety of the town; but in spite of this, chiefly owing to its favourable position for commerce, it continued to prosper, and survived the decay of most of the other Greek cities; and even under the Romans it was left free to manage its own affairs, and was allowed to demand dues from all ships passing through the Bosphorus, only part of these being claimed by the Romans. At the end of the second century of the Christian era Byzantium, unfortunately for itself, sided with Pescennius Niger against Septimius Severus. By the latter it was besieged for three years, and when at last it was forced to surrender, Severus ordered its walls to be razed to the ground, deprived the city of its privileges, and placed it under the jurisdiction of the Perinthians. For a time the prosperity of the city was annihilated, until a new and more brilliant era began for it under Constantine the Great. (See CONSTANTINE, CONSTANTINOPL.) Its early form of government was that of an aristocracy, which passed into an oligarchy. In the year 390 B.C. it received from Thasybulus a democratical constitution, closely resembling that of the Athenians. Byzantium was the great entrepot for the grain trade between the countries bordering on the Black Sea and those bordering on the Aegean. In its immediate neighbourhood excellent wine was grown, and the surrounding seas abounded in tunny fish. In addition to that the Byzantines carried on a large trade with neighbouring countries, exporting slaves, hides, honey, &c.

SUPPLEMENT.

BAKUNIN, MICHAEL, Russian socialist, the founder of Nihilism, was born in 1814 of a rich and noble family. He entered the army, but threw up his commission after two years' service, and studied philosophy at Moscow, with his friends Herzen, Turgeneff, Granowski (historian), and Behnaki (critic). Having adopted Hegel's system as the basis of a new revolution, he went in 1841 to Berlin, and thence to Dresden, Geneva, and Paris, as the propagandist of anarchism. Wherever he went he was influential for disturbance, and after undergoing imprisonment in various states, was handed over to Russia, in 1861, by Austria, imprisoned for five years, and finally sent to Siberia. Escaping thence through Japan, he joined Herzen in London on the staff of the *Kolokol*. His extreme views, however, ruined the paper and led to a quarrel with Marx and the International, and he fell into disrepute with his own party in Russia. He died suddenly and almost alone at Berne, in 1878. His views included the entire abolition of the state as a state, the absolute equalization of individuals, and the extirpation of hereditary rights and of religion, his conception of the next stage of social progress being purely negative and annihilatory.

BALÆNA, the genus which includes the Greenland or right whale, type of the family Balænidæ, or whale-bone whales. Hence *balæm* = whalebone.

BALÆNICEPS ('whale-head'), a genus of African wading birds belonging to the region of the Upper Nile, intermediate between the herons and storks, and characterized by an enormous bill, broad and swollen, giving the only known species (*B. rex*), also called shoe-bird, a peculiar appearance. It feeds on fishes, water-snakes, carrion, &c., and makes its nest in reeds or grass adjoining water. The bill is yellow, blotched with dark brown, the general colour of the plumage dusky gray, the head, neck, and breast slaty, the legs blackish.

BALÆNOPTERA, the genus to which the rorqual whale belongs. See *RORQUAL*.

BALANUS ('acorn-shells'), a genus of sessile cirripeds, family Balanidæ, of which colonies are to be found on rocks at low water, on submerged timbers, crustaceans, shells of mollusca, &c. They differ from the barnacles in having a symmetrical shell, and being destitute of a flexible stalk. The shell consists of six plates, with an operculum of four valves. They pass through a larval state in which they are not fixed, moving by means of swimming feet which disappear in the final state. All the Balanidæ are hermaphrodite. A S. American species (*Balanus patitacus*) is eaten on the coast of Chili, the *Balanus tintinnabulum* by the Chinese. The old Roman epicures esteemed the larger species.

BALATA, a substance somewhat resembling gutta-percha or india-rubber, and, like them, formed from the milky juice of a tree, the *Sapota Muellieri* or *Mimusops Balata*, common in British, French, and

Dutch Guiana, Brazil, British Honduras, &c., and known by the English name of *bully-tree*. Balata was formerly obtained by cutting down the trees, but this wasteful proceeding has been supplanted by the method of 'tapping', which does not injure the trees. The crude juice rapidly hardens in the air, and the dried mass assumes a leathery appearance and consistency, the colour being from whitish to reddish. It is more elastic than gutta-percha, and for certain purposes is considered superior both to it and to india-rubber. It softens and may be welded when heated to 120° F., and melts when heated to 270°. It readily forms vulcanite with sulphur. It was first introduced to Europe about 1859, and since then has been used for various purposes, as for insulators in telegraphic apparatus, for soles of shoes, for driving-belts, and for the fittings of artificial teeth. In the United States it is much used as a chewing gum.

BALFOUR, Right Hon. ARTHUR JAMES, son of Mr. Balfour of Whittinghame, Haddingtonshire, and a daughter of the second Marquis of Salisbury, was born July 25, 1848, and educated at Eton and Trinity College, Cambridge, where he took his M.A. degree in 1873. He acted as private secretary to his uncle the Marquis of Salisbury at the Foreign Office during the period to which the Berlin Treaty belongs (1878-80). He was president of the Local Government Board from June, 1885, till the beginning of the following year, and from July, 1886, till March, 1887, he discharged the duties of secretary for Scotland. He showed much ability as chief secretary for Ireland in 1887-91, but resigned this post in order to succeed Mr. W. H. Smith, who had lately died, as leader of the House of Commons and first lord of the treasury. On the defeat of the Unionist party at the general election of 1892 he relinquished this office, but returned to it when the Unionists again came into power in the autumn of 1895. In 1902, on the retirement of Lord Salisbury, he became prime minister. From 1874 till 1885 he sat for Hertford, but since 1885 he has represented East Manchester. In 1886 he was elected lord rector of St. Andrews University, in 1890 of Glasgow University; in 1888 he became F.R.S. Bimetallism has found in him a supporter, and he acted as chairman of the commission on the subject in 1887. He is an enthusiastic golfer, and contributed to the volume on Golf in the Badminton Series. In 1879 he published a Defence of Philosophic Doubt, in 1893 The Foundations of Belief, being Notes introductory to the Study of Theology. His brother, the Right Hon. GERALD WILLIAM BALFOUR (born 1853), was entered parliament in 1885, and became chief secretary for Ireland in the Unionist ministry of 1895. After the general election of 1900, which confirmed the Unionist government in power, he was appointed president of the Board of Trade.

BALFOUR, FRANCIS MATTLAND, embryologist, brother of the foregoing, born in 1851, studied at Harrow and Trinity College, Cambridge. Articles on his special study gained him a high reputation while still an undergraduate, and after further work at Naples he published, in 1874, in conjunction with Dr. M. Foster, the *Elements of Embryology*, a valuable contribution to the literature of biology. He was elected a fellow of his college, fellow and member of council of the Royal Society, lecturer on, and finally, in 1882, professor of, animal morphology at Cambridge, a chair specially instituted for him. The promise of his chief work *Comparative Embryology* (1880-81) was unfulfilled, as on July 18th, 1882, he was killed by a fall on Mont Blanc.

BALKASH, or **BALKHASH**, a salt lake in Russian Turkestan separating the provinces of Akmoinsk, Semipalatinsk, and Semirechensk, and surrounded by steppes and plains; area, 5500 square miles, depth nowhere more than 80 feet. It was formerly of much greater area, and is gradually growing smaller. It receives the Ili and other smaller streams.

BALL, SIR ROBERT STAWELL, the distinguished astronomer, was born at Dublin on July 1st, 1840. He received his education at Chester and Trinity College, Dublin, and in 1865 was appointed Lord Rosse's astronomer at Parsonstown. Since then he has held many posts in connection with astronomy and mathematics, including those of professor of applied mathematics and mechanism at the Royal College of Science for Ireland (1867), Andrews professor of astronomy in the University of Dublin and astronomer-royal of Ireland (1874), and Lowndean professor of astronomy and geometry in the University of Cambridge (1892). The Royal Society elected him a Fellow in 1873, and in 1886 he was knighted. His numerous works include *Theory of Screws* (1876), *Story of the Heavens* (1885), *Time and Tide* (1889), *Star-Land* (1889), *The Story of the Sun* (1893), *Great Astronomers* (1895), and many papers.

BALLADE, the earlier and modern French spelling of *ballad*, but now limited in its use to a distinct verse-form introduced into English literature of late years from the French and chiefly used by writers of *vers-de-société*. It consists of three stanzas of eight lines each, with an envoy or closing stanza of four lines. The rhymes, which are not more than three, follow each other in the stanzas thus: a, b, a, b; b, c, b, c, and in the envoy, b, c, b, c; and the same line serves as a refrain to each of the stanzas and to the envoy. There are other varieties, but this may be regarded as the strictest, according to the precedent of Villon and Marot.

BALLIA, a town of India, in the North-western Provinces, on the Ganges, the administrative headquarters of a district of same name in the Benares division. Pop. (1891), 16,372.

BALSAMODENDRON, a genus of trees or bushes, order Amygdaceae, species of which yield such balsamic or resinous substances as balm of Gilead, bdellium, myrrh, &c.

BALTIC PROVINCES, a term commonly given to the Russian governments of Courland, Livonia, and Esthonia.

BAMIAN, a valley and pass of Afghanistan, the latter at an elevation of 8496 feet, the only known pass over the Hindu Kush for artillery and heavy transport. The valley is one of the chief centres of Buddhist worship, and contains two remarkable colossal statues and other ancient monuments.

BANCROFT, GEORGE, American historian, was born at Worcester, Mass., October 3, 1800. After graduating at Harvard, he proceeded in 1818 to Gottingen, where he received the doctor's degree in 1820. He then removed to Berlin, where he attended

Hegel's lectures and made acquaintance with Schleiermacher and other philosophers. At Jena he met Goethe, and at Heidelberg he studied under the historian Schlosser. After travelling in Germany and Italy, and visiting Paris and London, he returned in 1822 to America, and engaged in tuition both at Harvard and in a school which he himself started. But he soon devoted himself to literature, declining a seat in the legislature, and publishing a volume of poems and some translations. In 1834 appeared the first volume of his *History of the United States*, of which the remaining nine volumes were published at intervals between 1837 and 1874. Other two volumes appeared as a separate work in 1882 under the title *History of the Formation of the Constitution of the United States*; and the whole came out in a revised form in 1884-85 in six volumes. In 1838 he was appointed collector of customs at Boston, and in 1845 secretary to the navy, in which capacity he was instrumental in founding the Washington observatory and a naval school at Annapolis. From 1846 to 1849 he was minister to Great Britain, and from 1867 to 1874 minister successively to Russia and Germany. He died at Washington 17th January, 1891. Bancroft published many works besides his history, including literary and historical miscellanies and a number of orations. His style is as a rule correct and dignified, picturesque without rising to eloquence. His presentation of facts is fair, though dominated by his undisguised democratic sympathies. See the *Life and Writings* by Dyer (1891).

BANDOLIER, a large leathern belt or baldric, to which were attached a bag for balls and a number of pipes or cases of wood or metal covered with leather, each containing a charge of gunpowder. It was worn by ancient musketeers and hung from the left shoulder under the right arm with the ball bag at the lower extremity, and the pipes suspended on either side. The name is now given to a similar belt by which a number of cartridges are conveniently carried.

RANEBERRY, *Actaea spicata*, a European plant, order Ranunculaceae, local in England, with a spike of white flowers and black, poisonous berries. Two American species are considered remedies for rattlesnake bite.

BANGWELO, LAKE, in South Africa, the southernmost and second in point of size of the great lake reservoirs of the Congo, was discovered by Livingstone in 1868. It is situated in Northern Rhodesia, near the Congo Free State frontier. Its area is about 1700 square miles, but both its size and its shape appear to be subject to variations. A great part of it is shallow and reedy. It is situated at a height of about 3800 feet above the sea.

BANJO (a negro corruption of *bundara*, It. *pandora*, from Greek *pandoura*, a three-stringed instrument), the favourite musical instrument of the negroes of the Southern States of America, and now widely popular elsewhere. It is six-stringed, has a body like a tambourine and a neck like a guitar, and is played by stopping the strings with the fingers of the left hand and twitching or striking them with the fingers of the right. The upper or octave string, however, is never stopped.

BANKSIA (named after Sir Jos. Banks), a genus of Australian shrubs and trees, order Proteaceae, with leathery leaves generally dark-green on the upper surface and pale below, often cultivated in conservatories for their peculiar foliage and flowers. They are named honeysuckles by the colonists, from the honey the flowers contain.

BANKURA, a town of Bengal, capital of a district of the same name in the Bardwan division, on the Dhalkosi river, healthy, and with a considerable trade. Pop. (1891), 18,747.

BANTAM. See FOWL.

BARBERTON, the chief mining centre of the De Kaap gold-fields, Transvaal, about 80 miles from Lydenburg and 150 to 160 from Delagoa Bay. It is connected with Durban, Pretoria, and Delagoa Bay by railway. Pop. about 2000.

BARRENTZ, WILLIAM, a Dutch navigator, born about 1680, who, on an expedition intended to reach China by the north-east passage, discovered Nova Zembla in 1694. While on a third expedition to the same region, in 1696, he discovered Spitzbergen, but owing to untoward circumstances he had to spend the winter of 1696-97 in Nova Zembla. He and his companions suffered great hardships, and these led to his death on the homeward journey.

BARING-GOULD, SABINE, English clergyman and author, was born at Exeter on Jan. 28th, 1831. He was educated at Clare College, Cambridge, where he took the M.A. degree in 1856, and since then he has held several livings in the English Church. In 1869 he was appointed to the incumbency of Dalton, Thirsk, and two years afterwards he became rector of East Mersea, Colchester. Since 1881 he has been rector of Lew Trenchard, Devon, where also is situated the family property to which he succeeded in 1872. He has written with success on theological and miscellaneous subjects, and has latterly distinguished himself as a novelist. Among his works are: *Iceland, its Scenes and Sagas* (1861); *The Book of Werewolves* (1865); *Curious Myths of the Middle Ages* (1866-67); *The Origin and Development of Religious Belief* (1869-70); *Lives of the Saints* (in 15 vols.) (1872-77); *Village Sermons* (1876); *The Vicar of Morwenstowe* (an account of the Rev. R. S. Hawker) (1876); *The Mystery of Suffering* (1877), &c., besides his numerous novels, among the first being *Malahal*, *John Herring*, *Richard Cable*, *The Gaverokes*, *Court Royal*, &c., and short stories or novelettes.

BARINGO, a lake in Equatorial Africa, N.E. of the Victoria Nyanza, about 20 miles long, 200 square miles in area, and between three and four thousand feet above sea-level. Though fed by many streams, it has no visible outlet. It was discovered by Thomson in 1883.

BARMOUTH (*Abermaw*), a seaport in Merionethshire, Wales, at the mouth of the river Maw, 10 miles west of Dolgelly. It is very picturesquely situated, and in recent times has become a favourite watering-place. Pop. (1891), 2045; (1901), 2213.

BARNABAS, the surname given by the apostles to Josias, a fellow-labourer of Paul, and, like him, ranked as an apostle. He is said to have founded at Antioch the first Christian community, to have been first bishop of Milan, and to have suffered martyrdom at Cyprus. His festival is held on the 11th June. There is an epistle in twenty-one chapters unanimously ascribed to Barnabas by early Christian writers, but without any support of internal evidence. It was probably written between 119 and 126 B.C. by one who was not a Jew, and under the influence of Alexandrian Judaistic thought.

BARNES, WILLIAM, English dialect poet and philologist, born in Dorsetshire in 1800, died 1886. Of humble birth, he first entered a solicitor's office, then taught a school in Dorchester, and having taken orders became rector of Winterbourne Came in his native county, and died there. He acquired a knowledge of many languages, and published works on Anglo-Saxon and English, as, *An Anglo-Saxon Delectus*, *A Philological Grammar*, grounded upon English, *Grammar and Glossary of the Dorset Dialect*, &c., but is best known by his *Poems of Rural Life in the Dorset dialect*, and *Rural Poems in common English*.

BARNET, or **HIGH BARNET**, a town of England, in Hert., 11 miles from London, where was fought, in 1471, a battle between the Yorkists and Lancastrians, resulting in the defeat of the latter and the death of Warwick, Edward IV. being thus established on the throne. An obelisk commemorates this battle. Pop. (1891), 5496; (1901), 7876.

BARRIE, JAMES MATTHEW, a Scottish novelist, was born May 9, 1860, at Kirriemuir, Forfarshire. He was educated first at his native place, and afterwards at Dumfries Academy and Edinburgh University, where he graduated as M.A. in 1882. After a brief connection with a Nottingham journal he removed to London, where he began to write for several newspapers, especially the *St. James's Gazette*. In 1887 appeared his first book, a satire on London life, entitled *Pat's Dead*, and in quick succession he published his better-known works, *Auld Licht Idyll* (1888); *When a Man's Single* (1893); *A Window in Thrums* (1899); *Thrums* (being *Kirriemuir*); and *My Lady Nicotine* (1900). The Little Minister, his first long story, appeared as a serial in *Good Words* in 1891, and shortly afterwards in book form, in a dramatized form (and considerably altered as regards plot and character) it has more recently enjoyed much success. In 1892 his popular comedy, *Walker, London*, was produced, and four years later a story, under the title *Sentimental Tommy*, was published. *The Professor's Love Story* (1894) was another successful play. Mr. Barrie received the honorary degree of Doctor of Laws from St. Andrew's University in 1898.

BARROW, a navigable river of Ireland, province of Leinster. It rises in the Sheshbloom Mountains, a few miles west of Portarlington on the borders of King's and Queen's Counties. Its course is generally southward, and after about 90 miles it joins the Suir to form the estuary called Waterford Harbour. It is navigable for vessels of 200 tons to New Ross, 25 miles from the sea, and for barges to Athlone in Kildare county, where it is joined by a branch of the Grand Canal.

BASE-BALL, a game played with a bat and ball which has obtained a sort of national character in the United States, and which is now played in accordance with a somewhat elaborate code of rules and regulations. It is very similar to the English game of 'rounders', and is played by nine players on each side. A diamond-shaped space of ground measuring 90 feet on each side is marked out, the corners being the bases. One side takes the field and the other sends a man to bat. When the field side take their places the 'pitcher', standing inside the ground near the centre and in front of the batsman, delivers a ball to the latter, who stands at the 'home base', and who tries to drive it out of the reach of the fielders, and far enough out of the field to enable him to run round the bases, which scores a run. If he cannot run round all he may stop at any one, but if he is touched by the ball he is out. He is followed by others on his side until three are put out, when the field side take the bat. Nine of these innings make a game, which the highest score wins. The bat is of a cylindrical shape, not more than 2½ inches in diameter, nor more than 42 inches long. The ball is about 9 inches in circumference and pretty elastic.

BASIL (*Ocimum*), a genus of plants of the natural order Labiatae. Over forty species have been enumerated, and they are all indigenous to the tropics or the warmer temperate climates. The aromatic leaves and tops of these plants are used in soups, stews, sauces, and some other dishes, occasionally also in salad; but the strong flavour of cloves which they possess is disagreeable to many tastes. They

are used in medicine for their carminative and antispasmodic properties, and are said to lessen the pains of child-birth. Two species are cultivated in Britain, Common Sweet Basil (*O. Basilicum*) and Bush Basil (*O. minimum*).

BASKING-SHARK. See SHARK.

BASS, the name of a number of fishes of several genera, but originally belonging to a genus of sea-fishes (*Labrax*) of the perch family, distinguished from the true perches by having the tongue covered by small teeth and the preoperculum smooth. *L. lupus*, the only British species, called also sea-dace, and from its voracity sea-wulf, resembles somewhat the salmon in shape, and is much esteemed for the table, weighing about 15 lbs. *L. lineatus* (*Roccus lineatus*), or striped bass, an American species, weighing from 25 to 30 lbs., is much used for food, and is also known as rock-fish. Both species occasionally ascend rivers, and attempts have been made to cultivate British bass in fresh-water ponds with success. Two species of black bass (*Micropterus salmoides* and *M. dolomieu*), American fresh-water fishes, are excellent as food and give fine sport to the angler.

BASSIA, a genus of tropical trees found in the East Indies and Africa, nat. order Sapotaceae. One species (*B. Parkii*) is supposed to be the shea-tree of Park, the fruit of which yields a kind of butter that is highly valued, and forms an important article of commerce in the interior of Africa. There are several other species, of which *B. longifolia*, or Indian oil-tree, and *B. butyracea*, or Indian butter-tree, are well-known examples, yielding a large quantity of oleaginous or butyraceous matter. The wood is as hard and incorruptible as teak.

BASSWOOD, **BAST**, the American lime-tree or linden (*Tilia americana*), a tree common in N. America, yielding a light, soft timber.

BAST, or **BASS**, a name given to the inner bark of the lime or linden-tree, of which mats and some other articles are made. The name is also given to the bark or coarse fibres of flax or hemp, of which brooms called bast brooms are made; and to some other fibrous materials of a like character. The manufacture of mats from the bast of the linden is in some districts of Russia, particularly in Viatka, Kostroma, and the adjoining districts, a considerable branch of industry. During the months of May and June the whole population of the villages is employed in the woods stripping the trees. The total manufacture of bast mats in Russia has been estimated at 14,000,000 pieces annually, of which only about one-fourth are exported, the remaining three-fourths being taken for home consumption.

BASTIAN, **HENRY CHARLTON**, English physician and biologist, was born at Truro on April 26th, 1837. He was educated at Falmouth and at University College, London, where he was assistant-curator in the museum in 1860-63. He obtained the degree of M.A. in 1861 from the University of London, graduating subsequently in medicine at the same university (M.B. 1863, M.D. 1866). In 1864-66 he was a medical officer in Broadmoor Criminal Lunatic Asylum, and in the latter year was appointed lecturer on pathology and assistant-physician in St. Mary's Hospital. In 1867 he became professor of pathological anatomy in University College, and in 1878 he was also appointed professor of clinical medicine. In 1887-95 he was professor of the principles and practice of medicine. Apart from numerous contributions to medical and other periodicals, and to Quain's Dictionary of Medicine, his works include *The Modes of Origin of Lowest Organisms* (1871); *The Beginnings of Life* (1872); *Evolution and the Origin of Life* (1874); *Lectures on Paralysis from*

Brain Disease (1875); *The Brain as an Organ of Mind* (1880), which has been translated into French and German; *Paralysis: Cerebral, Bulbar, and Spinal* (1886); *A Treatise on Aphasia and other Speech Defects* (1898); &c. He is an advocate of the doctrine of spontaneous generation.

BATES, **HENRY WALTER**, traveller and naturalist, was born at Leicester, February 8th, 1825, his father being a manufacturer. He was apprenticed to a hosiery manufacturer in Leicester, but joined the Mechanics' Institute, and devoted himself before and after business hours to study. His interest in natural history led to a correspondence with Mr. A. R. Wallace, with whom he left England in 1847 for the river Amazon. In this region he remained for eleven years, pursuing scientific investigations, particularly in entomology, in remote places, at the cost of shattered health. Returning to England he published in 1862 *The Naturalist on the River Amazon*, a work which attained immediate success, and is still regarded as a classical book of travel. In it he enumerated as many as 8000 new species of insects. He gained the friendship of Charles Darwin, who expressed high appreciation of Bates's memoir published by the Linnean Society, entitled *Contributions to an Insect Fauna of the Amazon Valley*, in which was given to the scientific world the phenomenon of mimicry with a philosophical explanation. Bates was made a fellow of the Royal Society in 1881. In 1884 he was appointed assistant secretary to the Royal Geographical Society, which office he retained till his death on February 16, 1892.

BATMAN (from *Fr. bat*, a pack-saddle), in the British army, a person allowed by the government to every company of a regiment on foreign service. His duty is to take charge of the cooking utensils, &c., of the company, and he has a bat-horse to convey these utensils from place to place.

BATTENBERG, a village in the Prussian province of Hesse-Nassau, from which the sons (bymorganatic marriage) of Prince Alexander of Hesse, uncle of Louis, grand-duke of Hesse, the husband of Princess Alice of Britain, derive their title of princes of Battenberg. One of them, Alexander, was Prince of Bulgaria in 1879-86, and died in 1893. Another, Prince Henry, was married to Princess Beatrice of Great Britain in 1885, and died in 1896. A third, Louis, is married to a daughter of Princess Alice.

BATTLE CREEK, a town of the United States, in Michigan, at the junction of the Kalamazoo and Battle Creek, with a college, and manufactures of agricultural implements, &c. Pop. (1890), 13,197.

BAUER, **BRUNO**, German philosopher, historian, and Biblical critic of the rational school; born 1800, died 1882. Among his works are: *Critique of the Gospel of John* (1840); *Critique of the Synoptic Gospels* (1840); *History of the French Revolution to the Founding of the Republic* (1847); *History of Germany during the French Revolution and the Rule of Napoleon* (1846); *Critique of the Gospels* (1850-51); *Critique of the Pauline Epistles* (1856); *Philos. Strauss, Renan, and Primitive Christianity* (1874); &c.

BAYA, the weaver-bird (*Ploceus philippinus*), an interesting East Indian passerine bird, somewhat like the bullfinch. Its nest resembles a bottle, and is suspended from the branch of a tree. The entrance is from beneath, and there are two chambers, one for the male, the other for the female. The baya is easily tamed, and will fetch and carry at command.

BAY CITY, a city of the United States, in Michigan, on the river Saginaw, about 4 miles from its mouth in Saginaw Bay, an inlet of Lake Huron.

It is a well-built town, lighted with gas and electricity, and with tramways in the principal streets. It is an important centre of trade, especially in timber. Pop. (1890), 27,839.

BAYONNE, a city of the United States, in New Jersey, a few miles to the south-west of New York, opposite Staten Island. It has chemical works and petroleum refineries and a trade in coal. Pop. (1890), 19,033.

BAY RUM, a spirit obtained by distilling the leaves of *Myrica asris*, or other West Indian trees of the same genus. It is used for toilet purposes, as a hair-wash, and as a liniment in rheumatic affections.

BAY-SALT, a general term for coarse-grained salt, but properly applied to salt obtained by spontaneous or natural evaporation of sea-water in large shallow tanks or *bays*.

BAY-WINDOW. See **BOW-WINDOW**.

BAZAINE, FRANÇOIS ACHILLE, French general, born at Versailles on Feb. 13th, 1817; died at Madrid on Sept. 23rd, 1888. He served in Algeria, in Spain against the Carlists, in the Crimean war, joined the Mexican expedition as general of division in 1862, and in 1864 was made a marshal of France. He commanded the third army corps in the Franco-German war, when he capitulated at Metz, after a seven weeks' siege, with an army of 175,000 men. For this act he was tried by court-martial in 1873, found guilty of dereliction of duty, and condemned to degradation and death. This sentence was commuted to twenty years' seclusion in the Isle Ste. Marguerite, near Cannes, from which he escaped in 1874 and retired to Spain, where the remainder of his life was passed in poor circumstances.

BEACONSFIELD, a town of the Cape Colony, in Gringalund West, formerly known as Du Toit's Pan. It lies a little to the east of Kimberley, with which it is connected by tramway, and is, like it, an upgrowth of the diamond fields. It is well supplied with churches, schools, and hotels. Pop. (1891), 10,478.

BEALE, LIONEL SMITH, physician and biologist, was born in London on February 5, 1828, being the son of Lionel John Beale, M.R.C.S. He was educated at King's College School and King's College, London, of which he is an honorary fellow. In 1852 he established a laboratory for chemical and microscopical studies, and in the following year he became professor of physiology and general and morbid anatomy in King's College, London. In the same college he held in succession the professorships of pathology and of the principles and practice of medicine, but in 1896 he retired from the latter post. He is a Fellow of the Royal Society, and for some years has acted as treasurer of the Royal Microscopical Society. His published works are numerous, and deal with medical, anatomical, physiological, and biological subjects, the microscope, &c. Among the most important are *How to Work with the Microscope*; *Protoplasm: or Life, Matter, and Mind*; *Life and Vital Action in Health and Disease*; *The Physiological Anatomy and Physiology of Man* (in collaboration with Dr. Todd and Sir W. Bowman); *Disease Gorms*; *Life Theories and Religious Thought*; *The Mystery of Life*.

BEAM-TREE (*Pyrus Aria*), a tree of the same genus as the apple, mountain-ash, and service-tree, found throughout Britain, having berries that are edible when quite mellow, and yielding a hard and fine-grained wood.

BEATING THE BOUNDS, the periodical survey or perambulation by which the boundaries of parishes in England are preserved. It is, or was, the custom that the clergyman of the parish, with the parochial

officers and the boys of the parish school, should march to the boundaries, which the boys struck with willow rods. A similar ceremony in Scotland is called *riding the marches*.

BEBEERINE, the active principle of the bark of the *lebeeru* or green-heart tree of Guiana, analogous to quinine, and used to some extent for similar purposes. See **GIBBERNAT**.

BECSÉ, Old, a town of Hungary, 18 miles s.w. Szegedin, on the right bank of the Theiss. Pop. (1890), 16,965. New BECSÉ, a market-town on the left bank of the Theiss, 5 miles E. of Old BECSÉ. Pop. 7000, or, with the immediately adjoining villages of Franyova (1890), 11,826. Both towns carry on an extensive trade in grain.

BEDDOES THOMAS LOVELL, dramatist and physiologist, was born at Chilton on July 20th, 1803. He published the *Birds of Tragdy* while an undergraduate at Oxford, and led an eccentric life, ultimately committing suicide. Based on Jan. 26th, 1849. His work was largely fragmentary, but his posthumous *Death's Jest Book, or the Fool's Tragedy* (1850), received the high praise of such judges as Landor and Browning. It was begun in 1825, and occupied him till his death, being mostly written while he was studying medicine in Germany. In 1890 Mr. Gosse edited an edition of his *Poetical Works* in two volumes, with a memoir, and in 1894 the same editor produced a volume of his letters.

BE-EATERS (*Megopoda*) a family of insectivorous birds of the division *Fringilliformes*, widely diffused over Europe, Asia, and Africa. The plumage is many coloured, of rich and delicate hues, green usually predominates, mixed with a greenish blue. The common European Bee-eater (*Megopa apus*) migrates from Africa, which appears to be its common residence, over the Mediterranean into the countries of Europe and Asia. This bird is common in Asia Minor, Turkey, Greece, and the south of Russia, and in the islands of the Mediterranean. They also visit Spain, Italy, France, Germany, and Switzerland. They have also been found in England, where they are commonly shot as strangers. The nest is placed in a burrow several feet deep, made in a bank. These birds usually lodge in groups, making their nests in proximity to each other. The food of the bee-eater consists wholly of insects, including bees and wasps. It is about the size of the common starling.

BEERSHEBA (now *Bir-es-Saba*, 'the well of the oath'), the place where Abraham made a covenant with Abimelech, and in common speech representative of the southernmost limit of Palestine, near which it is situated. It is now a mere heap of ruins near several wells, though it was a place of some importance down to the period of the Crusades.

BEGONIA, an extensive genus of succulent-stemmed herbaceous plants, order *Begoniaceae*, with fleshy oblique cordate leaves of various colours, and showy unisexual flowers, the whole perianth coloured. They readily hybridize, and many fine varieties have been raised from the tuberous-rooted kinds. From the shape of their leaves they have been called *the elephant's ear*. Almost all the plants of the order are tropical, and they have mostly pink or red flowers.

BELEMNITE, a name for straight, solid, tapering, dart-shaped fossils, popularly known as arrow-heads, thunder-bolts, finger-stones, &c., but in reality the internal shell or skeleton of a molluscous animal allied to the squid or sepiæ, and the type of an extinct family, *Belemnitidae*.

BELFRY, a bell-tower or bell-turret. A bell-tower may be attached to another building, or may stand apart (see **CAMPANILE**); a bell-turret usually rises above the roof of a building, and is often placed above the top of the western gable of a church,

the terms bell-cote, bell-gable, being also used. The part of a tower containing a bell or bells is also called a belfry.

BELIZE, or **BALIZE**, the capital of British Honduras, situated at the mouth of a river of the same name. It is regularly built, the principal street facing the sea. The houses are of wood, raised on pillars of mahogany about 10 feet in height. The harbour is good for vessels of moderate size. The town is defended by Fort George and by several batteries. There is an iron market-house, a government house, a public hospital, several churches, and other buildings. The fixed population is about 8000, but at certain seasons the town contains 15,000 to 20,000 inhabitants.

BELL, **ALEXANDER GRAHAM**, inventor of the telephone, was born at Edinburgh in 1847. He was educated at Edinburgh and in Germany, and settled in Canada in 1870. In 1872 he went to the United States and introduced for the education of deaf-mutes the system of visible speech contrived by his father Alexander Melville Bell. He became professor of vocal physiology in Boston University, and exhibited his telephone, designed and partly constructed some years before, at the Philadelphia exhibition in 1876. He also invented the photophone (1880) and the graphophone (1887). In 1882 he received the diploma and decoration of the Legion of Honour of France.

BELL, **ALEXANDER MELVILLE**, father of the above, was born at Edinburgh in 1819. He was a distinguished teacher of elocution in that city; in 1865 removed to London to act as a lecturer in University College; and in 1870 went to Canada and became connected with Queen's College, Kingston. He is inventor of the system of 'visible speech', in which all the possible articulations of the human voice have corresponding characters designed to represent the respective positions of the vocal organs. This system has been successfully employed in teaching the deaf and dumb to speak. Besides writing on this subject he has written on elocution, stenography, &c.

BELL, **JOHN**, English sculptor, born at Hopton, Suffolk, in 1811. His best-known works are the Eagle Slayer, Una and the Lion, The Maid of Saragossa, Imogen, Andromeda, statues of Lord Falkland, Sir Robert Walpole, Newton, Cromwell, &c., and the Wellington Memorial in Guddhall. He was one of the sculptors of the Guards' Monument in Waterloo Place, London, and the Prince Consort Memorial in Hyde Park. He was the author of several professional treatises, and of a drama, *Ivan: a Day and a Night in Russia*. He died on March 25, 1895.

BELL, **ROBERT**, journalist and miscellaneous writer, born in Cork, 1800; died in London, 1867. He settled in London in 1828, edited an important weekly paper, the *Atlas*, for several years, and afterwards the *Monthly Chronicle*, *Mirror*, and *Home News*. He compiled several volumes of *Lardner's Cabinet Cyclopaedia*, wrote three plays and two novels, and did a great deal of miscellaneous literary work; but he is best known by his annotated edition of the *British Poets*, the first volume of which appeared in 1854, and which was carried through twenty-nine volumes.

BELL, **THOMAS**, English zoologist, born at Poole, Dorset, 1782; died at Selborne, Hampshire, 1880. He studied medicine at Guy's and St. Thomas's hospitals, London, became a member of the Royal College of Surgeons in 1815, and soon secured a large practice as a dentist. In 1832 he was appointed professor of zoology in King's College, London, a post which he held almost to the last, his duties being very unimportant. Latterly he lived

for a number of years at Selborne in the residence that had belonged to the celebrated Gilbert White. His best-known separate works are his histories of British Quadrupeds, British Reptiles, and British Stalk-eyed Crustacea, published in Van Voore's series. In 1877 he published an excellent edition of White's *Natural History of Selborne*.

BELLAY, **JOACHIM DU**, distinguished French poet, known as the French Ovid; born about 1624, died in 1660. He joined Ronsard, Daurat, Jodelle, Belleau, Baif, and De Tisard in forming the 'Pleiad', a society the object of which was to bring the French language on a level with the classical tongues. Bellay's first contribution was *La Défense et Illustration de la Langue Française*. His chief publications in verse are *Recueil de Poésie*; a collection of love-sonnets called *L'Olive*; *Les Antiquités de Rome*, a series of sonnets; *Les Regrets*; and *Les Jeux Rustiques*. In 1655 he became canon of Notre Dame, and a short time before his death he was nominated archbishop of Bordeaux. Spenser translated some of his Roman sonnets into English; and there are translations of poems by him in *Andrew Lang's Ballads and Lyrics of Old France*.

BELL-BIRD, the name given to the *Chasmorhynchus nudicollis*, a South American passerine bird belonging to the family of clatterers, from its sonorous bell-like notes. The bird is about the size of a jay, and the male has pure white plumage. Some describe its song as resembling the strokes of a blacksmith on an anvil. The same name is given also to the *Myzantha melanophrys* of Australia, a bird of the family Meliphagidae (honey-suckers), whose notes resemble the sound of a bell.

BELLEVILLE, a town of the United States, capital of St. Clair co., Illinois, with important manufactures and a large rolling-mill. Pop. (1890), 15,361.

BELLEVILLE, a town of Canada, province of Ontario, capital of Hastings county, on the Bay of Quinté, an arm of Lake Ontario, at the mouth of the Moira, with flourishing trade and manufactures. It is rather a fine town, and has a Methodist Episcopal University for men and women (two colleges). Pop. (1891), 9914; (1901), 9117.

BELLUNO, a city of Northern Italy capital of a province of the same name, on the Piave, 48 miles N. of Venice. It has a cathedral, a handsome theatre, &c.; and manufactures of silk, straw-plait, leather, &c. Pop. (1897), 18,348.

BELUGA (*Beluga arctica* or *Delphinapterus leucas*), a kind of whale or dolphin, the white whale or white fish, found in the northern seas of both hemispheres. It is from 12 to 18 feet in length, and is pursued for its oil (classed as 'porpoise oil') and skin. In swimming, the animal bends its tail under its body like a lobster, and thrusts itself along with the rapidity of an arrow.

BENBECULA, an island of Scotland in the Outer Hebrides belonging to Inverness-shire, and lying between North and South Uist, separated from the latter by a channel only $\frac{1}{2}$ mile broad and dry at low water. It is circular in shape, about 8 miles in diameter, low, flat, and infertile, with innumerable lakelets and inlets of the sea. Pop. (1891), 1534.

BENEDIOT, **SIR JULIUS**, pianist and composer, was born at Stuttgart in 1804, and died at London in 1885. In 1821 he went to Dresden to study under Weber, and two years later he became conductor at a Vienna theatre. His first opera, *Giocinta ed Ernesto*, was produced in Naples in 1829 without success. He took up his residence in England in 1835, and was knighted in 1871. He was for many years conductor at the Norwich festival, and during

a number of seasons he acted as operatic conductor in London, both for English and Italian opera. His principal works are the operas, *The Gipsy's Warning* (1838), *The Bride of Venice* (1843), *The Crusaders* (1846), *The Lily of Killarney* (1862), founded on Boucicault's *Colleen Bawn*, and *The Bride of Song* (1864); the cantatas, *Undine* (1860) and *St. Cecilia* (1866); the fine oratorio *St. Peter* (1870); and the cantata *Graziella* (1882).

BENEFIT SOCIETIES. See FRIENDLY SOCIETIES.

BENNE OIL, a valuable oil expressed from the seeds of *Sesamum orientale* and *S. indicum*, which are much cultivated in India, Egypt, and elsewhere, the oil being used for similar purposes with olive-oil. It is also called *sesamum oil* and *gingelly oil*.

BENNETT, JAMES GORDON, an American journalist, was born in Banffshire, Scotland in 1795, and educated at Aberdeen. He emigrated to Halifax, Nova Scotia, in 1819 as a teacher, and went thence to Boston as a proof-reader. After being connected with various papers, he started the *New York Herald* in 1835. By his enterprise and not very scrupulous conduct of the journal it speedily became an enormous success, its yearly profit at his death being estimated at from a half to three quarters of a million dollars. It was the first paper which published a daily money article and stock lists. The expedition of Stanley to Africa in 1871 in search of Livingstone was projected and supported by Bennett, who, however, died in the following year.

BENNETT, SIR WILLIAM STERNDALE, an English composer, born on April 13th, 1816; at Sheffield, where his father was organist. He became a pupil of the Royal Academy in 1826, studying under Cipriani Potter, Croci, and Lucas, and afterwards Moscheles. By the advice of Mendelssohn, whose friendship he had gained, he studied in Leipzig from 1836 to 1838, and his performances and compositions were held in high esteem by the younger German musicians, and especially by Schumann. After a period spent in teaching, conducting, and composing, he was appointed professor of music at Cambridge in 1856, and he was knighted in 1871. In 1868 he became principal of the Royal Academy of Music. He was too entirely dominated by Mendelssohn's influence to do great original work. He is best known by his overtures, the *Naiads* and *Parmina*; his cantatas, the *May Queen* and *Woman of Samaria*; and his little musical sketches, *Lake, Millstream, and Fountain*. He died in London on Feb. 1st, 1875.

BENT-GRASS (*Agrostis*), a genus of grasses usually regarded as weeds except in soils which cannot produce better. Common Bent-grass or Purple Bent (*A. vulgaris*) is a fine-leaved species with trailing stems rooting at the joints, and small thin panicles of purplish satiny flowers. It overruns dry, gravelly, sandy places with its wiry stems, and becomes a troublesome weed, only to be got rid of by pulling up early in the season before the seed is ripe, or by frequent harrowing. It is, however, sometimes sown in warrens and in places where nothing better will grow. March Bent, White Bent, or Florin Grass (*A. stolonifera*), has broader leaves than common bent, a much closer and larger panicle, and green or pale flowers. It is very common in low damp places, which it overruns with its compact, trailing, rooting stems, and is a useful grass in newly reclaimed bogs or land liable to inundation. Herd-grass (*A. cornucopia* or *dispar*) has large panicles of green flowers, which form an almost level top. It is no longer cultivated in Britain, but is of high repute in France, as it yields an abundant crop on sandy and on moist calcareous soils.

BENTHAM, GEORGE, English botanist, nephew of Jeremy Bentham, was born near Plymouth on Sept. 22nd, 1800, and died on Sept. 10th, 1884. He was privately educated, early attached himself to botany, and having resided in Southern France (where his father had an estate) in 1814-26 he published in French (1826) a work on *The Plants of the Pyrenees and Lower Langueadoc*. Having returned to England he studied law, and on this subject, as well as logic, he developed original views. Finally, however, he devoted himself almost entirely to botany, was long connected with the Horticultural Society and the Linnæan Society, and from 1861 onwards was in almost daily attendance at Kew (except for a few weeks occasionally), working at descriptive botany from ten to four o'clock as a labour of love. Along with Sir J. D. Hooker he produced the great work of descriptive botany, *Genera Plantarum*; another great work of his was the *Flora Australiæ* (in 7 vols.). His *Handbook of the British Flora* is well known.

BERBER, town of Nubia, on the right bank of the Nile about twenty miles below the confluence of the Atbara, on the railway from Cairo to Khartoum. It consists of a collection of mud huts and a few buildings in the European style, and stands in a fertile district. A considerable trade is carried on with Egypt and the interior of Africa. Nearly the whole of the garrison and inhabitants of Berber were massacred by the insurgent Arabs during the Mahdi's rebellion in May, 1881. Pop. about 5000.

BERGHAUS, HEINRICH, German geographer, born at Cleve on May 3rd, 1797; died at Sletten on Feb. 17th, 1884. He served in 1815 in the German army in France, and was from 1816 to 1821 employed in trigonometrical survey of Prussia under the war department. From 1824 to 1855 he was professor of applied mathematics in the Berlin Academy of Architecture. Besides his various maps and his great *Physical Atlas* (republished in a remodelled form in 1886-92), he published *Allgemeine Länder- und Völkerkunde* (6 vols.), 1837-41; *Die Völker des Erdballs* (2 vols.), 1852; *Grundriss der physikalischen Erdbeschreibung*, 1856; *Grundriss der Ethnographie*, 1856; *Deutschland seit hundert Jahren* (5 vols.), 1859-62; *Was man von der Erde Weiss* (4 vols.), 1866-80; *Sprachschatz der Sassen*, or *Low German Dictionary* (incomplete); &c.

BERHAMPTON, a town of India, Ganjam district, Madras, 18 miles s.w. of Ganjam, and 525 N.E. of Madras, with both of which towns it is connected by rail. A good road leads from it to the coast town of Gopalpur, nine miles distant. As the head-quarters town of the district, it contains the usual official buildings. Silk cloth is manufactured, and there is a considerable trade in sugar. The climate is unhealthy. Pop. (1891), with cantonment, 25,653. — Another town of the same name is the head-quarters town of Moorshedabad district, Bengal, and stands on the left bank of the Bhagirathi, 5 miles south of Moorshedabad. The first open act of the mutiny took place here on Feb. 25th, 1857. The town contains a government college. Pop. (1891), 23,515.

BERIBERI, a disease of warm climates and almost confined to coast regions, endemic in parts of India, Ceylon, Japan, Brazil, &c., characterized by paralysis, numbness, difficult breathing, and often delirious symptoms, attacking strangers as well as natives, and generally fatal. Death may occur in from ten to thirty hours, or the patient may linger for several weeks. According to recent researches beriberi seems to be an infectious disease, and specific microbes in the blood have been observed to accompany it.

BERLIOZ, HECTOR, a French composer, born in 1808. He forsook medicine to study music at the Paris Conservatoire, where he gained the first prize in 1830 with his cantata *Sardanapale*, enabling him to study at Rome. For about two years he studied in Italy, and when on his return he began to produce his larger works, he found himself compelled to take up the pen both in defence of his principles and for his own better maintenance. As critic of the *Journal des Débats* and feuilletonist he displayed scarcely less originality than in his music. His chief literary works (besides his memoirs) are the *Traité d'Instrumentation*, 1844; *Voyage Musical*, 1845; *Les Soirées d'Orchestre*, 1853; and *A travers Chanta*, 1862. His musical works, which display remarkable originality, belong to the Romantic school, and are especially noteworthy for the resource they display in orchestral colouring. He was a great champion of what is commonly known as 'programme music'. His more important works are *Épisode de la Vie d'un Artiste: Symphonie Fantastique* (1829); *Lélio, ou Le Retour à la Vie* (1832); *Harold en Italie* (1834); *Romeo and Juliet* (1839); *Damnation de Faust* (1846), one of the best known and most admired of his works; the operas *Benvenuto Cellini* (1838), *Beatrice and Benedict* (1862), and *Les Troyens* (1864); *L'Enfance du Christ* (1854), the *Te Deum*, and the *Requiem*. He married an English actress, Miss Smithson, but latterly lived apart from her. He died at Paris on March 9th, 1869. After his death appeared *Mémoires* (1863-65), written by himself (English translation two vols., 1884).

BERNHARDT, ROSINE, better known as SARAH, a French actress, was born at Paris on Oct. 22nd, 1844. Of Jewish descent, her father French, her mother Dutch, her early life was spent largely in Amsterdam. In 1858 she entered the Paris Conservatoire and gained prizes for tragedy and comedy in 1861 and 1862; but her début at the *Théâtre Français* in *Iphigénie* and *Scirib's Valérie* was not a success. After a brief retirement she reappeared at the *Gymnase* and the *Porte Saint-Martin* in burlesque, and in 1867 at the *Odéon* in higher drama. Her success in Hugo's *Ruy Blas* in 1872 led to her being recalled to the *Théâtre Français*, since which she has abundantly proved her dramatic genius. In 1879 she visited London, and again in 1880, about which time she severed connection with the *Comédie Française* under heavy penalty. Among her most successful impersonations are *Théodora*, *Fédora*, *La Tosca*, and *Cléopâtre* in the plays bearing those titles. In 1882 she married M. Dumala, a Greek, whom she divorced not long afterwards. Her tours both in Europe and America have as yet never failed to be successful, despite a somewhat painful eccentricity. She is also known as a sculptor, painter, and playwright.

BERRYER, ANTOINE PIERRE, a French advocate and statesman, born in Paris, 1790. In 1814 he proclaimed at Rennes the deposition of Napoleon, and remained till his death an avowed Legitimist. He assisted his father in the defence of Ney, secured the acquittal of General Cambronne, and defended Lamennais from a charge of atheism. His eloquence was compared with that of Mirabeau, and after the dethronement of Charles X. (1830) he remained in the Chamber as the sole Legitimist orator. His political services won for him a public subscription of 400,000 francs in 1836 to meet his pecuniary difficulties. In 1840 he was one of the counsel for the defence of Louis Napoleon after the Boulogne fiasco. In 1843 he did homage to the Comte de Chambord in London, adhering to him through the revolution of 1848, and voting for the deposition of

the prince-president the morning after the *coup d'état*. He gained additional reputation in 1858 by his defence of Montalembert, and was counsel for the Patterson-Bonapartes in the suit for the recognition of the Baltimore marriage. In 1863 he was re-elected to the Chamber with Thiers, and in 1864 received a flattering reception in England. He died in 1868.

BESANT, SIR WALTER, English novelist, born at Portsmouth on Aug. 14th, 1836, was educated in London and at Christ's College, Cambridge, where he graduated with mathematical honours. He was for a time professor in the Royal College, Mauritius. His first work, *Studies in Early French Poetry*, appeared in 1868, and to the field of French literature also belong his *French Humorists* (1878), and his *Rabelais* (1877 for the Foreign Classics series). He was for years secretary to the Palestine Exploration Fund, and has published a *History of Jerusalem* (1871) in conjunction with Prof. Palmer, a life of whom he has also written. The *Survey of Western Palestine* was edited by him. He is best known by his novels, a number of which were written in partnership with the late Mr. James Rice, including *Ready-Money Mortiboy* (1872); *This Son of Vulcan*; the *Case of Mr. Lucraft*; *The Golden Butterfly* (1876); *The Monks of Thelema*; &c. Since Mr. Rice's death (1882) he has written *All Sorts and Conditions of Men* (1882), which led to the establishment of the People's Palace in London; *All in a Garden Fair* (1883); *Dorothy Foster* (1884); *The World Went very Well Then* (1887); *The Ivory Gate* (1892); *The Rebel Queen* (1893); *Beyond the Dreams of Avarice* (1895); *The Orange Girl* (1899); &c. Amongst his other works are *The Eulogy of Richard Jefferies* (1888), *London* (1892-93), *Westminster* (1895). He laboured to promote the interests of the literary profession, especially in his capacity as editor of the monthly paper, *The Author*. He died at Hampstead on June 10, 1901.

BESSEMER, SIR HENRY, English engineer and inventor, was the son of an artist and man of science, and was born in Hertfordshire on Jan. 19th, 1813. He exhibited in the Royal Academy at an early age, but devoted himself chiefly to invention in various fields. In 1856 he read before the British Association at Cheltenham a paper dealing with the invention which has made his name famous. This was a new and cheap process of rapidly making steel from pig-iron by blowing a blast of air through it when in a state of fusion, so as to clear it of all carbon, and then adding just the requisite quantity of carbon to produce steel—a process which has introduced a revolution in the steel-making trade, cheap steel being now made in vast quantities and used for many purposes in which its price formerly prohibited its application. He was a prolific inventor in various lines, his patents referring not only to steel manufacture but also to gold-paint, sugar machinery, steamboats, and telescopes. In 1879 he was knighted and was elected a fellow of the Royal Society. Many other distinctions, both home and foreign, were also conferred on him. He died on March 15th, 1898.

BETHNAL GREEN, an ex-suburban district of London, Middlesex, now forming a mun. bor. and a parl. bor. (two members). In 1872 a branch of the South Kensington Museum was opened here. Pop. of mun. bor. (1901), 129,681; parl. bor., 128,712.

BETONY, the popular name of *Stachys Betonica* (or *Betonica officinalis*), a labiate British plant with purple flowers which grows in woods, formerly much employed in medicine, and sometimes used to dye wool of a fine dark-yellow colour.—**WATER BETONY**, *Scrophularia aquatica*, is named from the resemblance of its leaf to that of betony.

BEUST, FRIEDRICH FERDINAND, COUNT VON, Saxon and Austrian statesman, was born at Dresden in 1809, died in 1886. He adopted the career of diplomacy, and as member of embassies or ambassador for Saxony resided at Berlin, Paris, Munich, and London. He was successively minister of foreign affairs and of the interior for Saxony. At the London conference regarding the Schleswig-Holstein difficulty he represented the German Bund. He lent his influence on the side of Austria against Prussia before the war of 1866, after which, finding his position in Saxony difficult, he entered the service of Austria as minister of foreign affairs, became president of the ministry, imperial chancellor, and in 1868 was created count. In 1871-78 he was ambassador in London, in 1878-82 in Paris.

BEVELAND, NORTH and SOUTH, two islands in the estuary of the Scheldt, belonging to Holland, province of Zealand; area of North Beveland, 15,200 acres, pop. 8000; area of South Beveland, 84,000 acres, pop. 23,000; chief town, Goes, 5000. They are very fertile, and have manufactures of salt, leather, beer, &c.

BEYLE, MARIE-HENRI, a French author widely known by his pseudonym *de Stendhal*; born at Grenoble on Jan. 23rd, 1783; held civil and military appointments under the empire; took part in the Russian campaign of 1812, thence until 1821 lived at Milan, chiefly occupied with works on music and painting. After nine years' residence at Paris he became in 1830 consul at Trieste, and in 1833 at Civita Vecchia. In 1841 he returned to Paris, where he died on March 23rd, 1842. The distinguishing feature of his works was the application of acutely analytic faculties to sentiment in all its varieties, his best books being the treatise *De l'Amour*, 1822; the novels *Le Rouge et le Noir*, 1830, and *Le Chartreux de Parme*, 1839. Amongst his other works are *Histoire de la Peinture en Italie* (1817), *Racine et Shakespeare* (1827), and *Vie de Napoléon*. A collective edition of his works appeared in 18 vols. in 1855-56, and his *Correspondance Inédite* in 2 vols. in 1856.

BHAMO, a town of Burmah, on the Upper Irrawaddy, about 40 miles from the Chinese frontier, and 180 N.W. of Mandalay, with which it has railway communication. About 20 miles above Bhamo the river suddenly narrows from 1000 to 150 yards and flows through a rocky gorge which is subject to eddies and back-waters. Navigation is at that point very difficult, and at times impossible. Bhamo is the starting-point of caravans to Yunnan, and is in position to become one of the great emporiums of the East in the event of a regular overland trade being established between India and Western China. Pop. (1891), 6986, besides about 1200 in the cantonment.

BHUJ, chief town of Outch in India, Bombay presidency, at the base of a fortified hill, with military cantonments, high school and school of art, museums of the Raos or chiefs of Cutch, &c. Pop. (1891), 25,421.

BICARBONATE, a carbonate derived from carbonic acid (H_2CO_3) by replacing one of the atoms of hydrogen by a monovalent metal. Bicarbonate of sodium ($NaHCO_3$) is used as an antacid, and effervescing liquors are usually produced by mixing it with tartaric acid. It is also the chief ingredient of baking-powder.

BIDERY (from *Bidar*, a town in India), an alloy, primarily composed of copper, lead, tin, to every 3 ozs. of which 16 ozs. of spelter (zinc) are added. Many articles of Indian manufacture, remarkable for elegance of form and gracefully-engraved patterns, are made of it. It is said not to rust, to yield little to the

hammer, and to break only when violently beaten. Articles formed from it are generally inlaid with silver or gold and polished; but the alloy is usually blackened first by the application of a solution containing sal-ammoniac.

BIEBRICH, a town of Prussia, 3 miles from Wiesbaden, on the right bank of the Rhine, with a fine castle, formerly the residence of the dukes of Nassau. Pop. (1895), 12,292.

BIENHOA, a town in Cochinchina, capital of a province of the same name, 15 miles N.W. of Saigon. Taken by the French in 1861, it is now one of their fortified posts. Pop. 10,000.

BIERLEY, NORTH, a town in the West Riding of Yorkshire, England, about 2 miles south from Bradford. There are several handsome places of worship, national and other schools, &c. The immense iron-works at Low Moor provide employment for upwards of 5000 people, and there are also coal and ironstone mines. Pop. (1901), 32,161.

BIG-HORN, the *Haplocerus montanus* or wild sheep of the Rocky Mountains, named from the size of its horns which are 5½ feet long, the animal itself being of the same height at the shoulder. The big horns are gregarious, going in herds of twenty or thirty, frequenting the craggiest and most inaccessible rocks, and are wild and untamable. It is called also Rocky Mountain goat.

BIGNONIA, a genus of plants of many species, inhabitants of hot climates, nat. order Bignonaceae, usually climbing shrubs furnished with tendrils; flowers mostly in terminal or axillary panicles, corolla trumpet-shaped, hence the name of *trumpet-flower* commonly given to these plants. All the species are splendid plants when in blossom, and many of them are cultivated in our gardens. *P. Leucosylon*, a native of Jamaica, is a tree 40 feet high; the leaves of *B. China* yield a red colouring matter, with which the Indians paint their bodies, *B. radicans*, or *Tecoma radicans*, is a much-admired species. See CHINA.

BIGNONIACEÆ, a natural order of plants, consisting of trees, shrubs, or more rarely herbaceous plants, mostly natives of America. There are upwards of 100 known genera and about 650 species, many of which are only remarkable for their large trumpet-shaped flowers. The species of the genus *Bignonia* are conspicuous objects in tropical forests, and are probably the hardest and most twining plants known. Many of them are cultivated in Britain and elsewhere as ornamental plants. (See BIGNONIA.) Several species of the genus *Tecoma* yield hard and almost indestructible timber. Others of the order have bitter and astringent qualities.

BILLETING OF SOLDIERS. Formerly soldiers were billeted on the inhabitants whenever there was a deficiency of accommodation in barracks or regular quarters. The necessity for billeting occurs chiefly during movements of the troops or when any accidental occasion arises for quartering soldiers in a town which has not sufficient barracks accommodation. The billeting of soldiers on private householders is now abandoned in Britain, and billeting is reduced as much as possible by camping out and other arrangements. Billeting is regulated by part iii. of the Army Act, 1881, which replaces the annual mutiny acts that formerly regulated it. All keepers of inns, livery stables, ale-houses, victuallers, retailers of wine and dram sellers, are liable to receive officers and soldiers billeted on them. Persons liable refusing to accommodate the military may be fined from 40s. to £5.

BILLITON, a Dutch East Indian island between Banca and the S.W. of Borneo, of an irregular sub-quadrangular form, about 40 miles across; area,

1868 sq. miles. It produces iron and tin, and exports sago, cocoa-nuts, pepper, tortoise-shell, trepang, edible birds'-nests, &c. It was ceded to the British in 1812 by the Sultan of Palembang, but in 1824 it was given up to the Dutch. Pop. (1897), 41,558.

BIMETALLISM, the prerogative of legal tender and for unlimited amount to be permitted to both gold and silver, as distinguished from *monometallism*, the currency system by which the legal tender is limited to the one or the other metal. The theory of bimetallism found one of its earliest champions and exponents in Henri Cernuschi, who, indeed, seems to have invented the term. Its advocates point out that until 1873 the whole world of finance was, whether consciously or not, equipped with a bimetallic currency, because until the mints of France and the other countries that formed the Latin Union were closed in that year to silver, any London merchant selling merchandise to the silver-using nations of Asia or South America could exchange that silver for its fixed gold equivalent by sending it to be coined at the Paris mint; so that while Great Britain during the years previous to 1873 was nominally gold-monometallic, she was actually bimetallic, because the Paris mint was as freely open to the merchant of London as to the merchant of Lyons. The claim, then, of the bimetalist is as follows:—Money, besides being the mechanism of exchange, is also the standard of deferred payments. The best standard is that standard which, when the period for payment arrives, asks no more and no less sacrifice from the debtor than obtained at the time the debt was contracted. If a debtor has borrowed the value of one bullock or one ton of rails, and is obliged, when the time of payment comes, to realize two bullocks or two tons in order to acquit his debt, then the money of the contract—of the standard—presses inequitably upon the debtor. It is claimed by the bimetalists, then, that changes in monetary law which date back to 1873, and which had for their object to give gold that monopoly of monetary prerogative it previously shared with silver—these changes have operated so as to enrich the bondholders and other creditor classes at the expense of the industrious classes, that because of these changes money has been made scarcer, and therefore dearer; in a word, that the great fall of prices which has been the leading economic feature of the past quarter of a century has been brought about by currency legislation in France, Germany, the United States, and still more recently in India.

The objection frequently urged to bimetallism has been that it was impossible by statute enactment to decree that in the payment of debts an ounce of gold was the equivalent of fifteen and a half ounces of silver (this was the mint ratio which was established in the Latin Union); in other words, that it was no more competent for legislation to maintain a ratio in the comparative values of gold and silver than in the values of beef and mutton. To this the bimetalist replies, that although the production of silver from the world's mines during the first thirty years of this century was, at the then existing valuation of 15½ to 1, three times that of gold, whereas after the gold discoveries of California and Australia in the middle years of the century the production of gold was three times that of silver, yet notwithstanding these abnormal and indeed unprecedented fluctuations of supply, so long as France acted as the world's money changer the values of gold and silver did conform very closely indeed to the ratio fixed by the French law. And bimetalists explain this remarkable conformity by the economic law of supply and demand. They point out that, if from the annual production of both the metals that amount is deducted

which is required to supply the arts and manufactures, the remainder available for currency is but a few millions yearly, as compared with many thousands of millions which in the form of national debt, private and mortgage debts, the universal debtor owes to his creditor. So that if the debtor is permitted the option of coming into the market and buying whichever metal he pleases to liquidate his debt, the demand of a myriad debtors will be at all times diverted to whichever of the two metals should tend to become (however fractionally) the cheaper, through new discoveries and consequent abundance. This being the case, given unlimited legal tender, 15½ ounces of silver could never become cheaper than an ounce of gold, nor an ounce of gold than 15½ ounces of silver. It is only in this way that the remarkable steadiness in the values of gold and silver *inter se*, during all the years of the century preceding 1873, can be accounted for, and this underlying cause of steadiness was unanimously admitted by the Royal Commission on Gold and Silver, which reported in 1888. This stability in the values of gold and silver is of extreme importance for other reasons than those of mere fair dealing between debtor and creditor. A steady 'par of exchange' between a gold-standard community such as Great Britain and a monometallic silver-standard community such as India is also secured. This is of the highest importance on social and racial even more than on economic grounds. For the 'index numbers' showing the average of prices, which are prepared by the Government of India, by the late Professor Soetbeer, by Mr. Augustus Sauerbeck, and others, show that while since the anti-silver legislation which dates back to 1873 silver has fallen in gold value more than one-half, yet its value—its purchasing power—in Asia has been fully maintained. Thus the rupee in India is as valuable to buy native commodities as ever, while in China Mr. Jamieson, Her Majesty's Consul-general at Shanghai, has been able to show that the purchasing power of the silver dollar and the tael is actually some nine per cent greater than when the gold price of silver was twice as great. Thus the result of the fall in the price of silver could not have failed to greatly stimulate the production of manufactures in countries having a silver standard, and the export of those manufactures and of agricultural produce also from silver-standard communities to gold-standard communities. For example, the exports of tin from Singapore gets as many of his silver dollars to-day in exchange for £60 as he formerly received for £120; in other words, he is enabled, because of the fall in the price of silver, to sell his ton of tin in London at half its former price; and the competition of 'Straits tin', stimulated in this way by falling exchanges, is believed by bimetalists to have been the chief reason for that great fall in the price of tin which has closed the tin mines of Cornwall during the past few years. And for similar reasons the fall in the silver exchanges is held accountable for the great fall in the price of wheat, the Punjab exporter getting more and more rupees per sovereign with each fresh fall in the price of silver. It is this racial aspect of the so-called 'silver question' which has attracted general attention in the United States, and which has made the 'battle of the standards' a burning political issue in that country. The claim made by the 'silver men' is, that the United States being enormously indebted to Europe, and being obliged to pay the interest charges by the export of her produce, cannot continue to export enough if exposed in the European markets to the competition of silver-standard countries, their exports stimulated and bonused by each fresh fall in the

price of silver. Thus the view of the American farmer is that silver must be restored to free coinage at the ratio of 1 to 16, because the consequent rise in the price of silver will, by raising the exchange rates with all Asia, shut off exports from Asia to Europe until gold prices have advanced in Europe to a point where the soil in America and in England can again be profitably cultivated. The present situation of the silver question was happily summed up by the Honourable T. B. Reed, the speaker of the 55th Congress of the United States, in the following phrase: 'The fall in the price of silver has enabled the yellow man with the white money to cut the throat of the white man with the yellow money'.

The contest between the two camps of currency disputants does not promise to achieve any early settlement. The advance in the value of gold has greatly enhanced the fortunes of bankers, and of cosmopolitan and Semitic financial houses, and the influence of these powerful classes and of the whole mass of bondholders is being thrown on the side of gold monometallism. On the other hand, not in the United States only, but also in France, Russia, and Germany, the numerous agrarian associations are agitating for the restoration of bimetallicism; while in 1896, Prince Bismarck, who was chiefly responsible for Germany's change of standard in 1873, wrote to Governor Culbertson of Texas, that he was of opinion the United States would be well advised to adopt the free coinage of silver without waiting for other and international action.

The gravity of the situation which had followed from the great fall of prices has, however, been somewhat alleviated owing to the great discoveries of new supplies of gold in South Africa, in West Australia, as well as in India, in the United States, and in Canada; and there is now the promise of further large reinforcements from Russia. The arrival of the new gold, just as was the case after the Californian discoveries, is no doubt relieving to some extent the great strain on gold experienced during the quarter of a century before 1886, and already there are symptoms that the new money is exercising some slight effect in raising prices.

The whole question of bimetallicism is a question of much economic complexity, and it involves not merely important social issues as between debtors and creditors, but great national issues as between debtor and creditor nations. Mr. Gladstone, speaking on the subject in the House of Commons, declared with entire frankness, that as England is the world's great creditor, the greater the fall of prices the greater the mass of their produce which her debtors have to pay to England. For this reason he ridiculed the idea that we should stir hand or foot to secure the restoration of bimetallicism. But even in the interest of England, it is not clear that a further fall of prices is desirable. The Australian colonies, for example, are amongst the most important debtors of England; their loans, public and private, are estimated at four hundred millions sterling; and they are dependent chiefly on the price of their wool for the means whereby they can pay their debts. The price of wool having fallen about one-half, the difficulty of exporting sufficient to pay the interest on their debts has already occasioned a bank panic, a vast reduction of values, and wide-spread disaster, while any further shrinkage in the price of wool might well make the financial difficulties in those colonies insuperable.

As to scientific opinion, bimetallicists may fairly claim, at least in Great Britain, that the professors are chiefly if not wholly on their side. While the younger generation of English professors, including

Foxwell, Shield Nicholson, and Marshall, are teaching the theory of bimetallicism from their several chairs of political economy, they have also had the support, and indeed the strenuous advocacy from abroad, of the late Emile de Laveleye, of Wolowski, of Ernest Seyd, of Professor Francis Walker, of Dana Horton, and Cernuschi, who have all passed away.

BINTURONG (*Arietis binturong*), a carnivorous animal of the civet family, with a prehensile tail, a native of the Eastern Archipelago.

BIOGENESIS, the history of life development generally; also that view which holds that living organisms can spring only from living parents. In the last sense it is opposed to *abigenism* or *spontaneous generation*.

BIOGRAPHY, that department of literature which treats of the individual lives of men or women; and also a prose narrative detailing the history and describing the character of an individual written by another. When written by the individual whose history is told it is called an *autobiography*. The species of writing is almost as old as literature itself. In the first century after Christ Plutarch wrote his Parallel Lives of Celebrated Greeks and Romans; Cornelius Nepos, the Lives of Military Commanders; and Suetonius, the Lives of the Twelve Cæsars. Modern biographical literature may be considered to date from the seventeenth century, since which time individual biographies have multiplied enormously. Some of the best of these are Boswell's Life of Dr. Johnson, Scott's Dryden and his Swift, Lockhart's Scott, Moore's Byron, Masson's Milton, Trevelyan's Carlyle, Carlyle's Frederick the Great, and the autobiographies of Benvenuto Cellini, Jerome Cardan, Sir Kenelm Digby, Benjamin Franklin, Dr. Carlyle of Inveresk, Gibbon, Hume, Hugh Miller (My Schools and Schoolmasters), and J. S. Mill. Dictionaries of biography have proved extremely useful, Moréri's Dictionnaire Historique et Critique, 1671, being perhaps the first of this class. During the nineteenth century have been published the Biographie Universelle, 85 vols., 1811-62; Chalmers's General Biographical vols., 1852-66; Rose's Biographical Dictionary, 32 vols., 1812-17; Rose's Biographical Dictionary, 12 vols., 1848-50; the admirable Dictionary of National Biography, completed in 63 volumes, the first of which appeared in 1885, the last in 1900 (Supp. 3 vols., 1901); and Appleton's Cyclopædia of American Biography, 6 vols. (1887-89).

BIRD, ISABELLA L. (Mrs. Bishop), a well known traveller, was born at Boroughbridge Hall, Yorkshire, on Oct. 15, 1832, and was educated privately. Since 1854 she has travelled extensively in North America and Asia, and she has described her journeys in many works. Of these the chief are The Englishwoman in America (1856); A Lady's Life on the Rocky Mountains (1874); The Hawaiian Archipelago: Six Months among the Palmyras, Coral Reefs, and Volcanoes of the Sandwich Islands (1875); Unwaten Tracks in Japan (1880; new edition abridged 1885); The Golden Chersonese and the Way Thither (1883); Journeys in Persia and Kurdistan, including a Summer in the Upper Karun Region, and a Visit to the Nestorian Royals (1891); Among the Tibetans (1893); and Korea and her Neighbours (1898). She married John Bishop, M.D., in 1881, but he died five years afterwards. Both at home and abroad she has taken a deep interest in philanthropic work, and her great geographical attainments procured her election in 1892 as a Fellow of the Royal Geographical Society, being the first lady to receive this honour.

BIRMINGHAM, a town of the U. States, capital

of Jefferson co., Alabama. It is the centre of the coal and iron industries in this portion of the U. States, and has sprung up since 1871. It has numerous blast-furnaces and other industrial establishments, and is an important railway centre. Its pop. in 1880 was only 3086; in 1890 it was 26,178.

BIRTHWORT (*Aristolochia dematitia*), a European shrub so called from the supposed services of its root when used medicinally in parturition. The name is also given to all the order Aristolochiaceae. See **ARISTOLOCHIA**.

BISALNAGAR, town of India, in Baroda, Bombay Presidency; it has manufactures of cotton and a transit trade. Pop. (1891), 21,376.

BISHNUPUR, a town of India, in Bankurá district of Bengal, with manufactures of cottons, fine silk cloth, and a brisk trade. Pop. (1891), 18,863.

BISHOP, MRS. See **BIRD**, ISABELLA (in SUPP.).
BISHOP-WEED (*Zygopodium Podagraria*), an umbelliferous plant of Europe, with thrice-ternate leaves and creeping roots or underground stems, a great pest in gardens from its vigorous growth and the difficulty of getting rid of it; called also *Gout-wort* (from its supposed efficacy in cases of gout), *Herb Gerard*, &c.

BISKARA, or **BISKRA**, a town of Algeria, with an important trade. It is situated at the southern base of the last spurs of the Aures mountains, about 120 miles s.w. of Constantine. The railway from Philippeville on the Mediterranean terminates here. New Biskara, or the French town, has (1896) 8417 inhabitants. Old Biskara, which is inhabited chiefly by Arabs, Berbers, and Negroes, has a population of about 70,000.

BISLEY, a parish and village of England in N.W. Surrey, where the annual meetings of the National Rifle Association are now held. Pop. (1891), 732.

BISLEY, a town of England, in Gloucestershire, 3 miles east of Stroud, with cloth manufactures. Pop. (1891), 5171; (1901), 4769.

BISMARCK ARCHIPELAGO, the name given by the Germans to New Britain, New Ireland, and other islands adjoining their portion of New Guinea.

BISMARCK-SCHÖNHAUSEN, OTTO EDUARD LEOPOLD, PRINCE, born of a noble family of the 'Mark' (Brandenburg), at Schönhausen, April 1, 1815; studied at Göttingen, Berlin, and Greifswald; entered the army and became lieutenant in the Landwehr. After a brief interval devoted to his estates and to the office of inspector of dikes, he became in 1846 a member of the provincial diet of Saxony, and in 1847 of the Prussian diet. In 1851 he was appointed representative of Prussia in the diet of the German Federation at Frankfurt, where, with brief interruptions, he remained till 1859, exhibiting the highest ability in his efforts to checkmate Austria and place Prussia at the head of the German states. From 1859-62 he was ambassador at St. Petersburg, and in the latter year, after an embassy to Paris of five months' duration, was appointed first minister of the Prussian crown. The Lower House persistently refusing to pass the bill for the reorganization of the army, Bismarck at once dissolved it (Oct. 1862), closing it for four successive sessions until the work of reorganization was complete. When popular feeling had reached its most strained point the Schleswig-Holstein question acted as a diversion, and Bismarck—by the skilful manner in which he added the duchies to Prussian territory, checkmated Austria, and excluded her from the new German confederation, in which Prussia held the first place—became the most popular man in Germany. As chanceller and president of the Federal Council he secured the neutralization of Luxembourg

in place of its cession by Holland to France; and though in 1868 he withdrew for a few months into private life, he resumed office before the close of the year. A struggle between Germany and France appearing to be sooner or later inevitable, Bismarck, having made full preparations, brought matters to a head on the question of the Hohenzollern candidature for the Spanish throne. The war having been carried to a successful issue, he became chancellor and prince of the new German empire. Subsequently, in 1872, he alienated the Roman Catholic party by promoting measures to which they strongly objected (the Falk laws) and expelling the Jesuits. He then resigned his presidency for a year, though still continuing to advise the emperor. Towards the close of 1873 he returned to power, retaining his position until, in March 1890, he disagreed with the emperor and tendered his resignation. He went into retirement at Friedrichsruhe, and for some time afterwards maintained in the press his opposition to the imperial policy; but subsequently he and the emperor became partly reconciled. In 1878 he presided at the Berlin Congress, in 1880 at the Berlin Conference, and in 1884 at the Congo or Colonial Conference. He died July 30, 1898. His life was twice attempted, namely, by Blind at Berlin in 1866 and by Kullmann at Kissingen in 1874. See Bismarck: the Man and the Statesman, a translation of his reflections and reminiscences by A. J. Butler; Lowe's Prince Bismarck; Busch's Our Chancellor, and Bismarck: Some Secret Pages of his History.

BISTORT (*Polygonum Bitorta*), a perennial plant of the buckwheat family (Polygonaceae), found in Britain, and from its astringent properties (it contains much tannin) sometimes used medicinally. It bears a raceme of flesh-coloured flowers, and may be met with in gardens.

BISTRE, or **BITER**, a warm brown pigment, a burned oil extracted from the soot of wood, especially beech. It furnishes a fine transparent wash, but is chiefly employed in the same fashion as sepia and Indian ink for monochrome sketches.

BITTERFELD, town in Prussian Saxony, on the Mulde, with manufactures of cloth, pottery, &c. Pop. (1895), 10,636.

BITTER-ROOT, *Lewisia rediviva*, a plant of Canada and part of the United States, order Portulacaceae, so called from its root being bitter though edible, and indeed esteemed as an article of food by whites as well as Indians. From the root, which is long, fleshy, and tapering, grow clusters of succulent green leaves, with a fleshy stalk bearing a solitary rose-coloured flower rising in the centre, and remaining open only in sunshine. Flower and leaves together, the plant appears above-ground for only about six weeks.—Californian bitter-root (*Echinocystis fabacea*) and Natal bitter-root (*Gerardanthus macrorrhiza*) both belong to the gourd family.

BITTELS, a liquor (frequently spirituous) in which bitter herbs or roots have been steeped. Gentian, quassia, angelica, bogbean, chamomile, hops, centaury, &c., are all used for preparations of this kind. The well-known Angostura bitters have aromatic as well as bitter properties. Bitters are employed as stomachics, anthelmintics, &c.

BITTER VETCH, a name applied to two kinds of leguminous plants: (a) *Ervum erilia*, a lentil cultivated for fodder; and (b) all the species of *Orobanch*, e.g. the common bitter vetch of Britain, *O. tuberosus*, a perennial herbaceous plant with racemes of purple flowers and sweet edible tubers.

BJÖRNSON, BJÖRNSTJERNE, Norwegian novelist, poet, and dramatist, born in 1832. He entered the University of Christiania in 1852, and he speedily became known as a contributor of articles and

stories to newspapers and as a dramatic critic. From 1857 to 1859 he was manager of the Bergen theatre, producing during that time his novel *Arne*, and his tragedy of *Halte Hulda*. He was at Christiania part-editor of the *Aftenblad* in 1860, then lived several years abroad, and in 1866 became editor of the *Norsk Folkeblad*. In 1869-72 he was co-director of a Copenhagen periodical, and much of his later life has been passed abroad. The democratic tendencies to be found in his novels have found a practical outcome in the active part taken by him in political questions bearing upon the Norwegian peasantry and popular representation. Among his tales and novels, a number of which may be had in English, are: *Synneve Solbakken*; *Arne*; *The Fishermiden*; *a Happy Boy*; *Railways and Churchyards*; *In God's Way*; *The Heritage of the Kurts*. Among his dramatic pieces are: *The Newly-married Couple*; *Mary Stuart in Scotland*; *A Bankruptcy*, &c. He has also written poems and songs.

BLACK, WILLIAM, novelist, born in Glasgow on Nov. 13th, 1841, first studied art, but eventually became connected with the Glasgow press. In 1864 he went to London, and in the following year joined the staff of the *Morning Star*, for which he was special correspondent during the Franco-Austrian war of 1866. His first novel, *Love or Marriage* (1868), was only moderately successful, but his *In Silk Attire* (1869); *Kilmeny* (1870); *The Monarch of Mincing Lane*, and especially *A Daughter of Heth* (1871), gained him an increasingly wide circle of readers. For four or five years he was assistant-editor of the *Daily News*, but in 1874 his connection with journalism practically ceased. His other works include *The Strange Adventures of a Phæton* (1872), containing descriptions of scenery much praised by Ruskin; *A Princess of Thule* (1873); *The Maid of Killeena*, &c. (1874); *Three Feathers* (1875); *Madcap Violet* (1876); *Green Pastures and Piccadilly* (1877); *Macloed of Dare* (1878); *White Wings, A Yachting Romance* (1880); *Sunrise* (1880); *The Beautiful Wretch* (1881); *Shandon Bells* (1883); *Judith Shakespeare* (1884); *White Heather* (1885); *Salina Zembra* (1887); *The Strange Adventures of a House-boat* (1888); *In Far Lochaber* (1889); *The New Prince Fortunatus* (1890); *Wolfenberg* (1892); *Highland Cousins* (1894); *Briseis* (1896); and *Wild Eelin* (1898). He died at Brighton on Dec. 10th, 1898. Mr. Black's novels have enjoyed much popularity. His subjects are drawn from many lands, but it is in dealing with the Scottish Highlands that he is at his best. He also wrote a *Life of Goldsmith* for the *English Men of Letters* series.

BLACK COUNTRY, a popular name for the district of coal-mines and iron-works in South Staffordshire, and extending into Warwick and Worcestershire.

BLACK DRAUGHT, a common purgative medicine consisting of sulphate of magnesia and infusion of senna, with aromatics to make it palatable.

BLACK GUM (*Nyssa multiflora*), order Cornaceæ), an American tree, yielding a close-grained, useful wood; fruit a drupe of blue-black colour, whence it seems to get its name of 'black': it has no gum about it. It is called also pepperidge, and is cultivated in Europe as an ornamental tree.

BLACK HILLS, a hilly region of the United States, in South Dakota and partly in Wyoming, rising to the height of 6700 ft., rich in timber, but especially in gold, as well as other minerals.

BLACKMORE, RICHARD DODDRIDGE, novelist, born at Longworth, Berkshire, on June 9th, 1825; educated at Tiverton School and Exeter College,

Oxford, where he graduated in 1847. In 1852 he was called to the bar at the Middle Temple, and afterwards practiced as a conveyancer. His greatest literary success was *Lorna Doone, a Romance of Exmoor* (1869), one of the best of modern romances. Other novels by him are: *Clara Vaughan* (1894); *Craddock Newell, a Tale of the New Forest* (1868); *The Maid of Sker* (1872); *Alice Lorraine, a Tale of the South Downs* (1876); *Cripps the Carrier* (1878); *Erma* (1877); *Mary Austerley* (1880); *Christowell* (1882); *Sir Thomas Upmore* (1884); *Springhaven* (1887); *Perilycross* (1894); *Daniel* (1897), &c. He has also published a translation of Virgil's *Georgics* (1862 and 1871). Amongst his volumes of original poetry are *Poems by Mulanter* (1854); *The Ringle of the Black Sea* (1855); and *The Fate of Franklin* (1860). Mr. Blackmore's work is characterized by vivid and accurate descriptions of nature and of rural life. His male characters are well drawn, and, though not the products of subtle analysis, they are boldly marked and consistent with his women, however, he is less successful. He is at his best in historical novels such as *Lorna Doone*, his greatest work, and *Alice Lorraine*. He died on 20th Jan., 1900.

BLACK QUANTER, a kind of apopleptic disease which attacks cattle, indicated by lameness of the fore-foot, one of the limbs swelling, and after death being suffused with black blood, which also is found throughout the body. The disease which chiefly attacks young cattle, is due to undrained fertile pasture, or to the too rapid transference of the cattle from poorer to richer soils. It is difficult to cure, but may be prevented by thorough draining or by giving regular doses of nitre to all the animals. The usual treatment consists in blood letting, cutting into the swollen parts, and administering first nitre and afterwards ammonium acetate and purgatives.

BLACKROCK, town of Ireland, co. Dublin, on Dublin Bay, about 5 miles from the capital. An important sea-bathing and residential locality with many fine residences. Pop. (1891), 8401; (1901), 8719.

BLACK-SNAKE (*Coluber constrictor*), a common snake in the United States, reaching a length of 5 or 6 feet, and so agile and swift as to have been named the *Racer*, with no poison fangs, and therefore comparatively harmless. It feeds on small quadrupeds, birds, and the like, and is especially useful in killing rats.

BLACK-THORN. See **PLUM**.

BLACK WADD, an ore of manganese, used in making chlorine gas and as a drying ingredient in paints. It is an earthy variety of the peroxide found in low-lying districts, and is often mixed with oxides of cobalt or copper.

BLACK WATCH, THE, a famous British regiment, originating as a body of Highlanders, raised about 1666, for the purpose of keeping the peace in the Highlands, and so named from their dark dress. The various companies of which this body consisted were first united and embodied in the regular army under the title of the 42nd Regiment in 1739; and since their commander, the Earl of Crawford, was a lowlander, an arbitrary tartan, known as the Black Watch tartan, was selected. After being for some years employed at home, the 42nd Regiment was sent abroad, and first distinguished itself in the battle of Fontenoy, 1745. Since then it has served in almost all the important wars in which Britain has been engaged, and has gained a splendid reputation for valour. From 1756 till 1767 the regiment was in America, and on its return it received the title of Royal Highlanders. It again served in America during the War of Independence, and in 1801 it particularly distinguished itself in Egypt at

the battle of Alexandria. The Black Watch was also present at Napoleon's final defeat in the battle of Waterloo; and since then it has gained special mention for its conduct at the Alma, in the Ashantee War, and at Tel-el-Kebir. When the present arrangement of the British regiments was adopted, in 1881, the 42nd became the first battalion of the Black Watch or Royal Highlanders, the second battalion being the old 73rd Regiment.

BLAENAVON, a town of England, in Monmouthshire, on the Avon, with coal-mines, blast-furnaces, steel-works, &c. Pop. (1901), 10,869.

BLANC, JEAN-JOSEPH-LOUIS, a French historian, publicist, and socialist, was born at Madrid, 29th October, 1811. He studied with great success in the college at Rodez, and completed his education at Paris. He was for a short time an attorney's clerk, afterwards a teacher of mathematics and a private tutor. Subsequently at Paris he devoted himself to the career of journalism, fighting stoutly in the ranks of the militant democracy. In 1839 he founded the *Revue du Progrès*, in which first appeared his great work on Socialism, *De l'Organisation du Travail* (separately published in 1840). In this work he condemns individual and competitive rivalry in labour; society should not be subjected to a perpetual combat, but should form a harmonious whole, in which each member should contribute according to his abilities, and be recompensed according to his needs. In 1841-44 appeared his *Histoire de Dix Ans: 1830-40*, in which he vigorously exposed the trickery and jobbery of the government of Louis Philippe, and which greatly contributed to bring about its downfall. On the outbreak of the revolution of 1848 Blanc was elected a member of the provisional government, and appointed president of the commission for the discussion of the question of labour. He has been unjustly charged with creating and organizing the disastrous scheme of national workshops (see *ATELIERS NATIONAUX*), a scheme which he strenuously opposed. After the closing of these workshops, and the June insurrection of 1848, he was prosecuted for conspiracy, but escaped to England, where he took up a lengthened residence. During this period he wrote the bulk of his famous *Histoire de la Révolution Française* (12 vols., 1847-62). His other works are: *Lettres sur l'Angleterre* (1866-67); *Histoire de la Révolution de 1848* (1870); *Questions d'Aujourd'hui et de Demain* (1873-74); &c. On the downfall of the second empire (1870) Blanc returned to Paris, became a member of the National Assembly in 1880, and died on the 6th December, 1882.

BLANCHING. See *ETIOLATION*.

BLANC-MANGE, in cookery, a name of different preparations of the consistency of a jelly, variously composed of dissolved isinglass, arrow-root, maize-flour, &c., with milk and flavouring substances.

BLANE, SIR GILBERT, Scottish physician, born in Ayrshire, 1749, died in London, 1834. He was educated at Edinburgh University, but took the degree of M.D. at Glasgow. He became private physician to Admiral Rodney, and then physician to the fleet in the W. Indies, in which position he introduced the use of lime-juice and other means of preventing scurvy into the navy. In 1783-95 he was physician in St. Thomas's Hospital. He was physician-in-ordinary to George IV. both before and after he became king. His chief publication is *Elements of Medical Logic*.

BLANKENBERGHE, a much-frequented seaside resort on the coast of Belgium, in the province of West Flanders, 12½ miles N.E. of Ostend. Pop. (1897), 4682.

BLANKENBURG, a town of Germany, in the

duchy of Brunswick, on the northern slope of the Hartz Mountains, a favourite resort of tourists. On the summit of a height is the ducal palace. Pop. (1896), 9289.

BLANKENESE, a town of Prussia, on the right bank of the Elbe, 5 miles W. of Altona; a pleasure-resort of the Altonese and Hamburgers. Pop. (1895), 4090.

BLANQUI, JÉRÔME ADOLPHE, French economist, born at Nice, 1798, died at Paris, 1854. While studying medicine at Paris he made acquaintance with Jean Baptiste Say, and was induced to devote himself to the study of economics. He succeeded Say in the Conservatoire des Arts et Métiers as professor of industrial economy. Blanqui, who favoured a free-trade policy, published, among other works, *Précis Élémentaire d'Économie Politique et Histoire de l'Économie Politique en Europe*.—**LOUIS AUGUSTE**, his brother, born 1805, died 1881, was early engaged as a socialistic revolutionist and conspirator, and spent much of his life in prison for his extreme opinions and actions.

BLEAK (*Leuciscus alburnus*), a small river fish, 6 or 7 inches long, of the Carp family. It somewhat resembles the dace, and is found in many European and British rivers. Its back is greenish, otherwise it is of a silvery colour, and its silvery scales are used in the manufacture of artificial pearls. It is good eating.

BLEEK, FRIEDRICH, German biblical scholar and critic, born 1793, died 1859. He was appointed professor of theology at Bonn, 1829, and spent the remainder of his life there. He was the author of commentaries and expository books, valuable introductions to the Old and New Testaments (1860-62), &c. He had a son who is the subject of the next article.

BLEEK, WILHELM HEINRICH IMMANUEL, son of the above, an able linguist, especially in the South African languages, born in Berlin, 1827; died at Cape Town, 1876. In 1855 he went to South Africa and devoted himself to the study of the language, manners, and customs of the natives. In 1860 he was appointed public librarian at Cape Town, and his researches were rewarded with a pension from the civil list. He was principal author of the *Handbook of African, Australian, and Polynesian Philology* (1858-63), his other chief productions being *Vocabulary of the Mozambique Languages* (1856), *Comparative Grammar of South African Languages* (1862), *Hottentot Fables and Tales* (1864), and *The Origin of Language* (1868).

BLENHEIM DOG. See *SPANIEL*.

BLENNY (*Blennius*), a genus of Acanthopterus fishes, having the body smooth, slippery, without scales, and covered with a mucous secretion. In many of the genus the young are hatched within the body of the female and produced alive. They are all small fishes, and valueless as an article of food. The Eyed or Butterfly Blenny (*B. ocellaris*) has two lobes in the dorsal fin, the first marked with a round black spot, surrounded by a white ring and then a black one. It is a native of the Mediterranean, but is occasionally found on the south coast of England by dredging. It is understood to live on minute crustaceans and molluscs. The Shanny (*B. pholis*) has the head without any appendages, the dorsal fin notched, and the pectoral fins rather large. (See *SHANNY*.) The family includes a number of other genera besides Blennius. The Viviparous Blenny (*Zoarces viviparus*) is common on the coasts of Scotland, Norway, and Sweden, and in the Baltic. Specimens have been found 13 inches in length containing 262 ova; when hatched in the body of the parent the young are so perfect that they put forth all the activity of existence.

BLESBOK (*Alcelaphus albifrons*), an antelope of South Africa with a white-marked face, a general purplish-chocolate colour, and a 'saddle' of a bluish colour: found in great numbers in the Transvaal and Orange Free State, and much hunted.

BLESSED THISTLE (*Cnicus benedictus*), a native of the South of Europe, formerly in great repute as a medicinal plant.

BLIDAH, a fortified town of Algeria, 30 miles inland from Algiers, well-built, with modern houses and public edifices, the centre of a flourishing district, and having a good trade. It is one of the chief stations on the railway connecting Oran, Algiers, and Constantine. Pop. (1896), 13,026.

BLIMBING, the Indian name of the fruit of *Averrhoa Bilimbi*, a small tree, family Oxalidaceæ, called also *Cucumber-tree*, the fruit being acid and resembling a small cucumber. The carambola (which see) belongs to the same genus.

BLIND, KARL, German political agitator and writer on history, mythology, and Germanic literature, was born at Mannheim on Sept. 4th, 1826. He was educated at Heidelberg and Bonn, and from his student days till he settled in England in 1852 he was continually engaged in agitating or in leading risings in the cause of German freedom and union, being frequently imprisoned. The democratic propaganda has since been supported by his pen, and he has written political and biographical works: *Fire-burial among our Germanic Forefathers*, *Teutonic Cremation*; *Yggdrasil, or The Teutonic Tree of Existence*; &c.

BLIND-COAL. See **ANTHRACITE**.

BLIND-FISH, the name of several species of fish, family Amblyopsidae, inhabiting the American cave-streams. They are all small, the largest not exceeding 5 inches. In the typical species (*Amblyopsis spelæus*) of the Mammoth Cave of Kentucky, the eyes are reduced to a useless rudiment hidden under the skin, the body is translucent and colourless, and the head and body are covered with numerous rows of sensitive papillæ, which form very delicate organs of touch.

BLIND HARRY. See **HARRY THE MINSTREL**.

BLIZZARD, a fierce storm of frosty wind with fine powdery snow, occurring in some parts of N. America, especially the western United States, and often causing loss of life through suffocation and cold. The most disastrous on record was that of 1888 in Dakota and the surrounding country. A very low temperature was recorded, and the air was so full of fine snow that objects could not be seen beyond a very small distance. More than two hundred persons perished.

BLOCK-SYSTEM, a system of working the traffic on railways according to which the line is divided into sections of 3 or 4 miles, each section generally stretching from one station to the next, with a signal and telegraphic connection at the end of each section. The essential principle of the system is that no train is allowed to enter upon any one section till the section is signalled wholly clear, so that between two successive trains there is not merely an interval of time, but also an interval of space.

BLOCK-TIN, tin at a certain stage of refinement, but not quite pure. See **TIN**.

BLOEMFONTEIN, the chief town and seat of government of the Orange River Colony, South Africa, 680 miles N.W. of Cape Town, situated in an elevated and healthy region. It stands on a plain surrounded by low hills, and is regularly laid out, having a large market-square in the centre. It has several fine buildings, including the Anglican cathedral, the Dutch Reformed church, and other places of worship; the presidency; the town-hall; the post-office; the

library; the national museum; the new Raadsaal, or council-chamber of the legislature; the old Raadsaal; Grey College and St. Andrew's College, for boys; the Eunice Institute for girls; a government hospital, and a cottage hospital; a lunatic asylum; &c. It is on the main railway line of the colony, which is continuous with the Cape Colony and Transvaal systems. Pop. about 8000, half being whites.

BLOOD-BIRD (*Myzomela sanguinolenta*), an Australian species of honey-sucker, so called from the rich scarlet colour of the head, breast, and back of the male.

BLOOD-FLOWER, the popular name for some of the red-flowered species of *Hemeranthus*, a genus of bulbous plants of the Amariyllis family, natives of the Cape of Good Hope. The most common species is *Hemeranthus coccineus*, or Cape Tulip, a very showy plant, the bulb of which is used as a diuretic.

BLOOD-RAIN, showers of grayish and reddish dust mingled with rain which occasionally fall, usually in the zone of the earth which extends on both sides of the Mediterranean westwardly over the Atlantic and eastwardly to Central Asia. The dust is largely made up of microscopic organisms, especially the shells of diatoms, the red colour being owing to the presence of a red oxide of iron.

BLOOD ROOT (*Sanguinaria canadensis*), a plant of Canada and the United States, belonging to the poppy order, and so named from its root-stock yielding a sap of a deep orange colour. Its leaves are heart-shaped and deeply lobed, the flower grows on a scape, and is white or tinged with rose. The plant has acid narcotic properties, and has been found useful in various diseases. *Groen canadensis*, of the rose order, another American plant used as a mild tonic, is also known as blood-root.

BLOOD-STONE. See **HEMISTOPE**.

BLOOD-WOOD, a name of several trees. Indian blood-wood (*Lagerstræmia Regina*), is a large tree of the henna family, with wood of a blood-red colour, used for many purposes. It is called also *Jamul*.

BLOOD-WORT, same as blood-root (*Sanguinaria*).

BLOOMINGTON, a city of the United States, capital of M. Lean county, Illinois, 60 miles N.W. of Springfield. It has several important educational institutions, including the Illinois Wesleyan University, the Major College for women, and (in the vicinity) the Illinois Normal University. It is an important railway centre, and has railway works, foundries, forges, coal-mines, &c. Pop. (1890), 20,481.

BLOW-FLY, a name for *Musca vomitoria*, *Sarcophaga carnaria*, and other species of two-winged flies (Diptera) that deposit their eggs on flesh, and thus taint it. See **FLY**, **DIPTERA**.

BLUE-BOTTLE, or **CORN-FLOWER**, *Centaurea Cyanus*, a British composite plant, rather tall and slender, with blue flowers, growing in corn fields.

BLUE-BOTTLE FLY, a large blue species of blow-fly (*Musca vomitoria*). See **BLOW FLY** above.

BLUE-BREAST. Same as **BLUE-THROAT** (which see below).

BLUE-COAT SCHOOL. See **CHRIST'S HOSPITAL**.

BLUE-FISH (*Temnodon* or *Pomatomus saltator*), a fish common on the eastern coasts of America, allied to the mackerel, but larger, growing to the length of 3 feet or more, and much esteemed for the table. It is very destructive to other fishes. It is also called horse-mackerel, green-fish, skip-jack, &c.

BLUE-GOWNS, an order of paupers in Scotland, called also the *King's Bedmen*, to whom the kings annually distributed certain alms on condition of their praying for the royal welfare. Their number was equal to the number of years the king had lived.

The alms consisted of a blue gown or cloak, a purse containing as many shillings Scots (pennies sterling) as the years of the king's age, and a badge bearing the words '*Pass and repass*', which protected them from all laws against mendicancy. Edie Ochiltree, who figures prominently in Sir W. Scott's novel *The Antiquary*, is a type of the class, but probably a favourable specimen as compared to those who were to be met with in real life. The practice of appointing bedsmen was discontinued in 1833, and the last of them drew his last allowance from the exchequer in Edinburgh in 1863.

BLUE-GRASS (*Poa pratensis*), an American and European pasture grass of great excellence, especially abundant in Kentucky. It belongs to the same genus as the annual meadow-grass (*Poa annua*) and other very common species. In some parts it gives excellent hay, but it is chiefly valuable as pasture.

BLUE JOHN, a name for fluor-spar.

BLUE MOUNTAINS, the central mountain range of Jamaica, the main ridges of which are from 6000 to 8000 feet high. Also a mountain chain of New South Wales, part of the great Dividing Range. The highest peak is Mt. Beemarang, which attains an elevation of 4100 feet above sea-level. The range is now traversed by a railway, which attains a maximum height of 3494 feet.

BLUE PETER, a blue flag having a white square in the centre, used to signify that the ship on which it is hoisted is about to sail.

BLUE-STONE, or **BLUE-VITRIOL**, sulphate of copper, a dark-blue crystalline salt used in dyeing and for other purposes.

BLU-THROAT, a bird (*Sylvia suecica*) with a tawny breast marked with a sky-blue crescent, inhabiting the northern parts of Europe and Asia, and occasionally found in Britain. It is a bird of passage, and is taken in great numbers in France for the table. In beginning to sing it seems to imitate portions of the songs of other birds, but its own song is very sweet.

BLUE-VITRIOL. See **BLUE-STONE** above.

BLUNDERBUSS, a short gun with a very wide bore, capable of holding a number of slugs or bullets, and intended to do execution at a limited range without exact aim. It went out of use shortly after 1860.

BLUNT, JOHN HENRY, English theological writer, was born in London on Aug. 25th, 1823, and died there on April 11th, 1884. He held various curacies, and latterly was appointed to the living of Beverston, Gloucestershire. He wrote much, among his chief works being *Dictionary of Doctrinal and Historical Theology* (1870); *Dictionary of Sects, Heresies, &c.* (1874); *History of the English Reformation* (1888); *Household Theology* (1885); *Annotated Book of Common Prayer* (1866; revised and enlarged, 1884).

BLUNT, JOHN JAMES, English divine, was born at Newcastle-under-Lyme in 1794, and died at Cambridge on June 18th, 1855. From 1839 he was Lady Margaret professor of divinity at Cambridge. His works include *Sketch of the Reformation in England* (1832); *Undesigned Coincidences in the Old and New Testament, an Argument for their Veracity* (1847); *On the Right Use of the Early Fathers* (1857); *History of the Church during the First Three Centuries* (1856); several volumes of sermons; &c.

BLYTH, a seaport and market town of England, in Northumberlandshire, at the mouth of the Blyth, which after a course of about 20 miles forms here a small estuary. The town stands on the south bank of the river, 12 miles N.E. of Newcastle, is well built, has a church in the early English style, mechanics' institute with library and reading-room, petty ses-

sional court and police buildings, a memorial hospital, &c. The harbour is safe and convenient; there are five large docks, and a pier about a mile long forming a promenade. The industries include ship-building, engineering works, brick-making, &c.; and there are twenty collieries within a radius of four miles. A very large export trade in coal is carried on. In 1898 the number of vessels entered was 8020 of 1,715,195 tons, and 2978 of 1,870,361 tons cleared. The township of Cowpen is contiguous to Blyth proper, and is now generally regarded as being included in the town of Blyth. The population of the urban district of Cowpen in 1901 was 17,803, and of the registration sub-district of Blyth, 25,478.

BOAT-BILL (*Cauloroma cochlearia*), a South American bird of the family Ardeidae or herons, about the size of a common fowl, with a short and very broad bill not unlike a boat with the keel uppermost. It has a pendent plume or crest on the back of the head, and large strong wings. It frequents thick woods on the banks of rivers, and feeds on various aquatic creatures.

BOAT-FLY (*Notonecta glauca*), an aquatic hemipterous insect which swims on its back; the hind-legs aptly enough resembling oars, the body representing a boat; hence the name; common in Britain. It frequents stagnant waters, swimming rapidly on the surface, but diving below whenever the water is disturbed. In colour it is gray and black, with greenish elytra and white wings. The small insects which constitute its food are devoured in very large numbers. The female usually deposits the eggs on the stems and leaves of aquatic plants.

BOATSWAIN (commonly pronounced bō'sn), a warrant-officer in the navy who has charge of the sails, rigging, colours, anchors, cables, and cordage. His office is also to summon the crew to their duty, to relieve the watch, &c. In the merchant service the name is given to one of the crew who has charge of the rigging and oversees the men.

BOBBIO, a small town of N. Italy, prov. Pavia, the seat of a bishop, with an old cathedral, and formerly a celebrated abbey founded by St. Columbanus.

BOB-O-LINK. See **RISE-BUNTING**.

BOBRUISK, a fortified town of Russia, in the government of Minsk, on the right bank of the navigable Beresina, 100 miles S.E. of Minsk, with which it is connected by rail. Pop. (1897), 35,177.

BOCHOLD, or **BOCHOLT**, a town of Prussia, in the province of Westphalia, on the Bochter Aa. It carries on cotton-spinning and weaving, tanning, iron-founding, &c. Pop. (1895), 16,273.

BOCHUM, a Prussian town, in the government of Arnsberg, prov. of Westphalia, 5 miles N.E. of Essen and between 20 and 30 miles N.E. of Düsseldorf. It is on the railway from Dortmund to Duisburg, and has manufactories of iron, steel, hardware, carpets, tobacco, &c. Pop. (1895), 53,842.

BODEN-SEE. See **CONSTANCE LAKE** OF.

BODENSTEDT, FRIEDRICH MARTIN VON, German poet and miscellaneous writer, born in 1819. He studied at Göttingen, Munich, and Berlin, and became tutor to the young Prince Gallitzin at Moscow. Having obtained an educational appointment at Tiflis he published a work on the peoples of the Caucasus (1848), and *A Thousand and One Days in the East* (1849-50), which were very successful. In 1854 he was appointed professor of Slavic at Munich, and in 1858 was transferred to the chair of Old English. He subsequently was theatrical director at Meiningen, and travelled and delivered lectures in the United States. Among the best of his poetical works are the *Songs of Mirza-Schaffi*, purporting to be translations from the Persian, but

really original, which have passed through more than 150 editions. He published translations from Marlowe, Ford, Webster, and other contemporaries of Shakespeare, translated Shakespeare's Sonnets, and with other writers joined in a new translation of Shakespeare's dramatic works (1866-72, 9 vols.). He died in 1892.

BOEHM, SIR JOSEPH EDGAR, R.A., sculptor, born at Vienna, 1834, of Hungarian parents. He studied art in England in 1848-51, subsequently in Italy, Paris, and Vienna, and settled in England in 1862, becoming naturalized in 1865. He executed many statues for public monuments, including those to Bunyan at Bedford, Carlyle and Tyndall on the Thames Embankment, Besant and Stanley for Westminster, &c., besides many portrait-busts. In 1881 he was appointed sculptor-in-ordinary to the queen, and in 1889 he was honoured with a baronetcy. He was the fashionable sculptor of his day, and though he did some good work much of what he produced was but mediocre. His designs for the jubilee coinage of 1887 were universally condemned. He died Dec. 12, 1890.

BOGARDUS, JAMES, an American inventor, born in 1800, died 1874. Among his inventions were the 'ring-spinner' or 'ring-spinner' used in cotton manufacture (1828), the eccentric mill (1829), an engraving machine (1831), and the first dry gas-meter (1832). In 1839 he gained the reward offered by the British Government for the best plan for manufacturing postage-stamps. In 1847 he constructed the first complete cast-iron building in the world, and the first wrought-iron beams were made from his design. His delicate pyrometer and deep-sea sounding machine were valuable additions to scientific instruments.

BOG-BUTTER, a fatty spermaceti-like mineral resin found in masses in peat-bogs, composed of carbon, oxygen, and hydrogen, and formed by the decomposition of peat.

BOGHEAD COAL, a brown cannel-coal of Scotland, found at Boghead, near Bathgate, and very valuable for gas and oil making.

BOG-OAK, trunks and large branches of oak found imbedded in bogs and preserved by the antiseptic properties of peat, so that the grain of the wood is little affected by the many ages during which it has lain interred. It is of a shining black or ebony colour, derived from its impregnation with iron, and is frequently converted into ornamental pieces of furniture and smaller ornaments, as brooches, ear-rings, &c.

BOHEA, an inferior kind of black tea. The name is sometimes applied to black teas in general, comprehending Souchong, Pekoe, Congou, and common Bohea.

BOHME. See **BOEHME**.

BÖHTLINGK, OTTO, German Sanskrit scholar, was born at St. Petersburg in 1815. He received his education in his native city, and in 1853 removed to Germany. In 1842 he returned to St. Petersburg and resided there many years, but latterly lived much in Jena and Leipzig. His chief work is a Sanskrit-German dictionary in 7 vols. (St. Petersburg, 1858-75), prepared in conjunction with Prof. Roth of Tübingen. In 1879-89 he issued a smaller edition giving the meanings (with considerable additions), but omitting the quotations.

BOIARS, BOYARS, an order of the old Russian aristocracy, next in rank to the ruling princes, and bearing much the same relation to them as the lesser barons of England and Scotland did to the greater in the feudal ages. The boiars enjoyed many exclusive privileges, held all the highest military and civil offices, and were so powerful that the ancient

imperial ukases contained the clause, 'The emperor has willed it, the boiars have approved it'. The order was abolished by Peter the Great, who gave its members a place in the Russian nobility.

BOILING-SPRINGS. See **GETSENA**.

BOISE CITY, a city of the United States, capital of Idaho, in Ada county, on the right (N.) bank of the Boise river, near the Oregon boundary, and about 250 miles N.E. of San Francisco. Within 50 miles of it there are placer and quartz gold-mines, and the surrounding country is excellently adapted for agriculture and grazing. Pop. (1890), 2311; now about 6000.

BOJARDO. See **BOIARDO**.

BOJOL, one of the Philippine Islands, north of Mindanao, about 10 miles by 30 miles. It is woody and mountainous. Rice and gold are its chief productions. Pop. 18,000.

BOLAMA. See **ULAMA**.

BOLAS (that is 'balls'), a form of missile used by the Paraguan Indians, the Patagonians, and especially by the Gauchos of the Argentine Republic. It consists of a rope or line having at either end a stone, ball of metal, or lump of hardened clay. When used it is swung round the head by one end, and then hurled at an animal so as to entangle it.

BOLCHOW. See **BOLSHOFF**.

BOLOMETER, a most sensitive electrical instrument invented by Langley in 1883, for the measurement of radiant heat. The instrument contains an exceedingly fine platinum wire, which is placed successively in different portions of the spectrum; and any change in the temperature of the wire, however slight, is immediately revealed by the deflection of a galvanometer.

BOMA, a seaport and trading station on the right bank of the lower Congo, the seat of the government of the Congo Free State.

BOMBARD, a kind of cannon or mortar formerly in use, generally loaded with stone instead of iron balls. Hence the term *bombardier*.

BOMBARDIER, originally an artillery soldier whose special duties are connected with the loading and firing of shells, grenades, &c., from bombards, mortars, or howitzers. Bombardier is now the special title of a non-commissioned officer in the British artillery ranking with a corporal. See previous article.

BOMBARDON, a large brass musical instrument of the sax-horn kind, and the lowest of these instruments. It is made in more than one size, and the largest is generally of circular form and big enough to go round the body of the performer. It is not capable of very rapid execution.

BOMBASIN. See **BOMBASINE**.

BOMBYX, the genus of moths to which the silkworm moth (*B. mori*) belongs.

BONAIRE ISLAND. See **BURN AYRE**.

BONASSUS, a species of wild ox, the aurochs. **BONAVISTA**, the name of a bay, cape, district, and town on the east coast of Newfoundland. The greatest width of the bay is 39 miles, and it is studded with islands. The town stands near the cape, about 70 miles N. by W. of St. John's. Pop. 3551.

BONE-ASH, BONE-EARTH, the earthy or mineral residue of bones that have been calcined so as to destroy the animal matter and carbon. It is composed chiefly of phosphate of lime, and is used for making cupels in assaying, &c.

BONE-CAVES, caverns containing deposits in which are embedded large quantities of the bones of animals (many of them extinct), dating from the Pleistocene or later geologic periods. See **CAVE**.

BONE-DUST, bones ground to dust to be used as manure. See **BONE MANURE**.

BONHEUR, MARIE-ROSA, a distinguished French artist and painter of animals, was born at Bordeaux on 22nd March, 1822, and received her earliest instruction in art from her father. When only eighteen years old she exhibited two pictures, Goats and Sheep, and Two Rabbits, which gave clear indications of talent. Since that time a long list of pictures, Tillage in Nivernais (1849); the Horse Fair (1853), regarded as her masterpiece; Haymaking (1865); Sheep at Pasture (1871); Forest of Fontainebleau (1873); Monarch of the Glen (1879); &c., have made her name famous throughout Europe. In 1865 she received the Grand Cross of the Legion of Honour. In her pictures of animals she shows great fidelity to nature and very considerable power of delineating life. She travelled in Scotland on one occasion, and some of her pictures represent Scottish landscapes and domestic animals. She died on May 25th, 1899, at Hy, a village on the border of the Forest of Fontainebleau. Her father, two brothers, and a sister also made themselves known as artists.

BONNIVARD, FRANÇOIS DE, the 'prisoner of Chillon', was born at Geneva in 1496. An ardent republican, he took the side of the Genoese against the pretensions of the Dukes of Savoy. In 1530 he fell into the hands of the duke, and was imprisoned till 1536 in the castle of Chillon, when the united forces of the Genevese and the Bernese took Chillon. He died at Geneva in 1570. Byron's poem, The Prisoner of Chillon, deals with his sojourn in prison.

BONNY, a river of W. Africa, one of the mouths of the Niger. The town of the same name is situated on the eastern bank of the river near its mouth. It has a good harbour and does a considerable trade in palm-oil, but the climate is unsuitable for Europeans. Pop. about 8000.

BOOLE, GEORGE, English mathematician and logician, was born at Lincoln on Nov. 2nd, 1815, and died at Cork on Dec. 8th, 1864. Educated in his native place, he opened a school in his twentieth year, and by private study gained such proficiency in mathematics that in 1849 he was appointed to the mathematical chair in Queen's College, Cork, where the rest of his life was spent. In 1857 the universities of Dublin and Oxford conferred on him the degrees of LL.D. and D.C.L. respectively. In mathematics he wrote on Differential Equations; General Method in Analysis; The Comparison of Transcendents, &c. In logic he wrote An Investigation of the Laws of Thought (1854), an amplified edition of his earlier Mathematical Analysis of Logic (1847), a profound and original work, in which a symbolic language and notation were employed in regard to logical processes.

BOOM, a town in Belgium, about 10 miles south of Antwerp. Its chief industries are tanning, salt-making, and brick-making. Pop. (1897), 13,838.

BOUSSA. See BOUSSA.

BOOT, an article of dress, generally of leather, covering the foot and extending to a greater or less distance up the leg. The sandal formed the chief foot-covering amongst the Greeks and Romans, and it is still in common use amongst Eastern nations. The boot, properly so called, came into use as part of the warrior's equipment about the fourteenth or fifteenth century, and since then it has assumed many different forms. The jack-boot, a kind of top-boot not yet altogether discarded, was in common use during the latter half of the seventeenth century, but was to a great extent displaced by the Hessian, which in its turn has given way to more recent forms. See SHOES AND SHOE-MAKING.—The name was given to an instrument of torture made of iron, or of iron and wood, fastened on to the leg, between which and the boot wedges were introduced

and driven in by repeated blows of a mallet, with such violence as to crush both muscles and bones. The special object of this form of torture was to extort a confession of guilt from an accused person.

BOOTH, EDWIN THOMAS, an American actor, son of the distinguished English actor, Junius Brutus Booth (1796–1852; spent most of his life in the U. States). He was born in 1833 near Baltimore, and made his first appearance at Boston in 1849. He was eminent for his impersonation of Shakspearian characters, Othello, Richard III., Iago, Shylock, &c., and was regarded as the leading American tragedian of his time. In 1882 he made a professional tour in Europe, and was favourably received. He died in 1893. His brother JOHN WILKES BOOTH (born 1838), also an actor, was the murderer of President Lincoln, April 14, 1865. He was shot by those who sought to bring him to justice.

BOOTH, REV. WILLIAM, 'General' Booth, was born at Nottingham on April 10, 1829, and educated privately. He was for some years a minister of the Methodist New Connexion, but resigned in 1861 in order to be free to devote himself to evangelistic work throughout the country. In 1865 he began the Christian Mission in the East End of London, an organization which thirteen years later assumed the name of the Salvation Army. The Army is organized throughout on military principles, and under Mr. Booth's able guidance has developed enormously. (See SALVATION ARMY.) In 1890 his scheme for ameliorating the condition of the more degraded and vicious classes in England was propounded in his book, In Darkest England and the Way Out, and the funds liberally subscribed for this work have enabled him to extend very considerably the operations of the Army. He has written many other works and has established several weeklies and monthlies. He has travelled extensively in connection with his various benevolent schemes.

BOIPARD, an ancient walled town of Rhenish Prussia, district of Coblenz, on the left bank of the Rhine, about 10 miles south of Coblenz, formerly an imperial city. It contains an old Roman Catholic church in late Romanesque style; a church of the old Catholics, dating from 1318; a modern Protestant church; a synagogue; Roman Catholic seminary, &c. Pop. (1895), 5582.

BORAGINACEÆ, the Borage family, a natural order of mostly regular-flowered monopetalous dicotyledons, with alternate rough leaves, four or five-parted persistent calyx, five-cleft corolla, five stamens alternating with the corolla lobes, and four-lobed ovary producing distinct nutlets in fruit. It contains a large number of herbs or shrubs chiefly found in the northern temperate regions, among them being borage (Borago), alkanet (Anchusa), comfrey (Symphytum), and forget-me-not (Myosotis).

BORAS, a town of Sweden, in the province of Elfsborg, 36 miles east of Gothenburg. It was founded by Gustavus Adolphus in 1632. There are some cotton and linen manufactures, and also some dyeworks. Pop. (1897), 12,371.

BORDIGHERA, a town of N.W. Italy, on the Mediterranean coast, in the district of San Remo and province of Porto Maurizio, a favourite winter residence for invalids. Pop. (1881), 2556.

BORECOLE, a variety of *Brassica oleracea*, a cabbage with the leaves curled or wrinkled, and having no disposition to form into a hard head.

BORGERHOUT, a Belgian town, forming a suburb of Antwerp, with bleaching and dyeing works, and woollen manufactures, &c. Pop. (1895), 81,380.

BORGU, a district of Africa, in the Western Sudan, lying about lat. 10° N., and stretching from the meridian of Greenwich east to the Niger. It is

hilly in parts, but much of it is well-watered and extremely fertile. Amongst its numerous productions are rice, grain, indigo, cotton, bananas, and citrons. The inhabitants are Mohammedan. Kiama and Wawa are chief towns.

BORISSOFF, a Russian town, gov. Minsk, 50 miles north-east of the town of that name, on the left bank of the Berezina. Not far from it took place the disastrous passage of the Berezina by the French in 1812. Pop. (1892), 19,898.

BORISSOGLEBSK, town of Russia, gov. Tambow, 163 miles south-east of the town of that name, with an active trade. Pop. (1892), 26,355.

BORNEO, BRITISH NORTH, a British colonial possession, consisting of the north-eastern part of the island of Borneo (which see), together with all the islands within three leagues of its coast. The area is about 31,100 square miles, and the coast-line has a length of about 1000. The colony is about equally distant from Hong-Kong, Singapore, and Port Darwin in Australia. The interior is mountainous, and in Mount Kinabalu, the highest peak of the island, attains a height of about 13,700 feet, but much of the country is covered by jungle and marsh. The coast is well provided with bays and harbours, among the chief being those of St. Lucia, Darvel, Sandakan, and Labuk. Though its rivers are shorter than those of the rest of the island, British North Borneo is well watered. The soil, especially in the river valleys, is very fertile. The economic vegetable products are numerous and important, but differ little from those of Borneo generally. The flora is rich in pitcher-plants, rhododendrons, orchids, ferns, and other striking and beautiful plants, the neighbourhood of Mount Kinabalu being especially interesting. In respect of its fauna British North Borneo resembles the rest of the island, but the elephant, rhinoceros, and wild cattle (*Bos banteng*) are almost or quite restricted to it. Both gold and coal occur in the colony. Tobacco is successfully cultivated, chiefly in the north and east; coffee, coco-nuts, gambier, pepper, hemp, rhea, india-rubber, tapoca, and sweet-potatoes are also among the vegetable products grown; and the country is well adapted in parts for the cotton plant. There are one or two cutch factories, saw-mills, and engineering works. The trade is of steadily increasing importance. The exports amounted to £288,585 in 1898, and the imports to £241,908. The chief articles of export are tobacco, cutch, timber, gutta-percha, sago, rattans, and india-rubber; and the imports are rice, grain, flour, cloth, machinery, telegraph and railway materials, tobacco, opium, oils, fruits and vegetables, &c. The trade is mostly carried on with Singapore, Hong-Kong, and the Philippines. There is very little direct trade with the United Kingdom. The timber trade with China is growing. A line of telegraph connects Mempakul, near Labuan, with Sandakan, and a railway is being constructed from Brunei Bay towards the interior. A telegraphic cable connects the protectorate with Singapore. There are no roads of importance as yet. The climate is tropical, but not unhealthy, except in marshy districts. The rainy season extends from October to February, April and May being the driest months, but rain falls in abundance in every month. The present capital is Sandakan, possessed of an excellent harbour; and other important towns are Kudat, the former capital, on Marudu Bay; Gaya, the port of the chief cattle district; Silam, on Darvel Bay, with experimental gardens. The history of British North Borneo dates from 1877, when a British company was formed to administer territories obtained from the sultans of Brunei and Sulu. In Nov. 1881, the British North Borneo Company was chartered, and in 1888

its position was strengthened by the declaration of a British protectorate over the territory belonging to it. In 1889 the island of Labuan was placed under the administration of the company. The territory is under a governor appointed by the court of directors in London, subject to the approval of the colonial secretary. For administrative purposes nine provinces have been formed. A small Sikh police force serves to maintain order. Education is at present carried on only in schools attached to churches and missions. There are several Protestant churches and schools, and the Roman Catholics have missionary priests at work. The revenue proper, exclusive of the proceeds of land sales, was £48,171 in 1898, the expenditure being £38,726. The revenue is derived from land and other rents, customs duties, licenses, a poll-tax of 2s. per year on natives, &c. There is no public debt. Accounts are kept in dollars and cents, the dollar being valued at 2s. The population is estimated at 170,000 and consists of Malays, Sulus, Filipinos, and native tribes, besides Chinese traders and labourers. The Malays and allied tribes profess Mohammedanism.

BOROLYCEERINE, a compound obtained by the union of boric acid with glycerol in the proportion of 31 to 18 at 392° F. It is transparent, and of a yellow colour. It is a powerful antiseptic, and being perfectly harmless is as useful in the preservation of fruit, &c., as in surgery, &c.

BOROUGH-ENGLISH, in law, a mode of descent in some ancient boroughs and manors, in which the owner's youngest son, or his youngest brother (if he has no issue), is the heir. It is evidently a custom of Saxon origin, and is so named to distinguish it from the Norman customs. It still holds in a few places.

BORROWING DAYS, the last three days of March, Old Style; the popular notion being, in Scotland and some parts of England, that they were borrowed by March from April. The fiction is of great antiquity, and probably arose in the observation of a frequent wintry relapse about the end of March.

BORSAD, a town of India, Bombay Presidency, between Baroda and Amudabad, and distant from each about 40 miles. Pop. (1891), 12,159.

BORY DE SAINT VINCENT, JEAN BAPTISTE GEORGE MARIE, French naturalist, born 1780, died 1846. About 1800-2 he visited the Canaries, Mauritius, and other African islands. He afterwards served for a time in the army, and conducted scientific expeditions to Greece and to Algeria. Among his chief works are *Annales des Sciences Physiques* (8 vols., 1819-21); *Voyage dans les quatre principales Iles des Mers d'Afrique* (3 vols., 1804); *Expédition Scientifique de Morée* (3 vols., 1832); *L'Homme Essai zoologique sur le Genre Humain* (2 vols., 1836).

BORYSTHENES, the ancient name of the Dnieper.

BOSCH-VARK, the bush-hog or bush-pig of South Africa (*Choiropotamus* or *Potamocheerus africanus*), one of the swine family, about 5 feet long, and with very large and strong tusks. The Kaffirs esteem its flesh as a luxury, and its tusks, arranged on a piece of string and tied round the neck, are considered great ornaments.

BOSWORTH, JOSEPH, English philologist, was born in Derbyshire in 1789. Educated at Repton, Aberdeen, and Trinity College, he was ordained a deacon in 1814, and after filling several livings in England was British chaplain at Amsterdam and Rotterdam for twelve years. He devoted much time to researches in Anglo-Saxon and its cognate dialects, the result of his studies appearing from time to

time. His chief works are his Anglo-Saxon Grammar; Dictionary of the Anglo-Saxon Language; and Compendious Anglo-Saxon and English Dictionary. In 1857 he was presented to the rectory of Water Sheldford, Buckingham, and next year was appointed Rawlinson professor of Anglo-Saxon at Oxford, a post which he held till his death in 1876. He was M.A. and LL.D. of Aberdeen; Ph.D. of Leyden, and D.D. of Cambridge. In 1867 he gave £10,000 to establish a professorship of Anglo-Saxon at Cambridge. He left a certain amount of materials that he had accumulated for a new edition of his larger Anglo-Saxon Dictionary, and these have been utilized and greatly added to by Professor Toller of Manchester in the copious Dictionary which has been published under his editorship by the Clarendon Press.

BOTANY BAY OAK, a name of trees of the genus *Canarium*. See BEEF-WOOD in SUPP.

BOTANY BAY RESIN, scaroid resin, which see in SUPP.

BOTARGO, a relish made of the salted roe of the mullet or tunny, used on the Mediterranean coasts.

BOTAURUS, the bittern genus of birds. See BITTERN.

BOT-FLY. See GAD-FLY.

BOTHIE (Gael. *bothay*, a oot), a house, usually of one room, for the accommodation of a number of work-people engaged in the same employment; especially, a house of this kind in parts of Scotland, in which a number of unmarried male or female farm servants or labourers are lodged in connection with a farm. Bothies are most common in the north-east of Scotland, and are chiefly for the accommodation of unmarried male farm servants engaged on the larger farms, who as a rule have to do their cooking and keep the bothie in order for themselves. The bothie system has often been condemned.

BO-TREE, the *Ficus religiosa*, peepul, or sacred fig-tree of India and Ceylon, venerated by the Buddhists and planted near their temples. One specimen at Anuradhapura in Ceylon is said to have been planted before 200 B.C. It was greatly shattered by a storm in 1887. See PEPUŁ.

BÖTTGER, or BUTTGER, JOHANN FRIEDRICH German alchemist, the inventor of the celebrated Meissen porcelain. See CHINAWARE.

BOTTICELLI, SANDRO, or ALESSANDRO, a celebrated Florentine painter, whose real name was Filipepi, but who took the name of his first master, was born in 1447. He was one of the most distinguished pupils of Filippo Lippi, the Carmelite, and is reckoned the richest and most fanciful colourist of the Florentine school. He excelled both in devotional and mythological subjects, and was an admirable painter of flowers. He painted three of the frescoes on the walls of the Sistine Chapel, and a celebrated example, 'The Virgin and Christ surrounded by the celestial hierarchies', was formerly in the Hamilton Collection. He became an ardent follower of Savonarola, and is said latterly to have neglected his art and suffered many privations. He died in 1515. He is said to have been one of the engravers of a celebrated series of illustrations executed by Florentine artists towards the close of the fifteenth century, notably a set of nineteen designs for the Divina Commedia of Dante (1471).

BOTTLE-NOSE (*Hyperodon rostratus*), a kind of whale, of the dolphin family, 20 to 28 feet long, with a beaked snout and a dorsal fin, a native of northern seas. Bottle-noses are frequently stranded on the shores of Britain. Spermaceti and a kind of sperm-oil are obtained from it. The casing-whale is also called bottle-nose.

BOTTLE-TREE (*Delonix regia*), a tree of North-eastern Australia, order Sterculiaceae, with a stem that bulges out into a huge rounded mass. It abounds in a nutritious mucilaginous substance, used by the natives as an article of food.

BOUGIE, a fortified seaport on the coast of Algeria, well situated for trade, which it carried on in the middle ages to a greater extent than now, though under French rule it is again prosperous, exporting wax, honey, grain, &c. Pop. (1896), 6610.

BOULDER, a rounded water-worn stone of some size; in geology, applied to ice-worn and partially smoothed blocks of large size lying on the surface of the soil, or embedded in clays and gravels, generally differing in composition from the rocks in their vicinity, a fact which proves that they must have been transported from a distance, probably by ice. When lying on the surface they are known as *erratic blocks*. The *boulder-clay* in which these blocks are found belongs to the post-tertiary or quaternary period. It occurs in many localities, consists of a compact clay often with thin beds of gravel and sand interspersed, and is believed to have been deposited from icebergs and glaciers in the last glacial period. Its colour varies according to the prevailing character of the rocks in the district where it is found, but it is commonly blue or red. Fossils and shells of other formations have been found embedded in it. It occurs throughout Scotland, in Northern and Middle England, Germany, Russia, and other countries, being known in Scotland as *till*.

BOULOGNE-SUR-SEINE, a town of France, in the department Seine, south-west of Paris, of which it is a suburb. It is from this place that the celebrated Bois de Boulogne gets its name. Pop. (1896), 36,984.

BOURG. See BOURG-EN-BRESSE.

BOURGAS. See BURGAS.

BOUSSINGAULT, JEAN BAPTISTE JOSEPH DIEUDONNÉ, French chemist, was born at Paris on Feb. 2nd, 1802, and died there on May 12th, 1887. He went to S. America in the employment of a mining company, and made extensive travels and valuable scientific researches there. Returning to France he became professor of chemistry at Lyons in 1839, was made a member of the Institute, and then made Paris his chief residence. His works deal chiefly with agricultural chemistry, and include *Économie Rurale* (translated into English and German); *Mémoires de Chimie agricole et de Physiologie*; *Agronomie*, *Chimie agricole*, et *Physiologie*, &c.

BOVIDÆ, the ox family of animals, including the common ox, the bison, buffalo, yak, zebu, &c. They are hollow-horned ruminant animals, generally of large size, with broad, hairless muzzles and stout limbs, and most of them have been domesticated.

BOWMAN, SIR WILLIAM, English anatomist and surgeon, was born at Nantwich on July 20th, 1816. He was for some time surgeon to King's College Hospital, London, and professor of physiology and anatomy in King's College, and was especially distinguished as an ophthalmic surgeon. He gained the Royal Society's royal medal for physiology in 1842. In 1880 Cambridge, and in the following year Edinburgh, conferred on him the degree of LL.D. He was connected with a large number of scientific societies both British and foreign. He was collaborator with Todd in the great work on the *Physiological Anatomy and Physiology of Man* (5 vols., 1845-56), and he also wrote on ophthalmology. His baronetcy was conferred on him in 1884; and he died in London on Mar. 29th, 1892.

BOWSTRING-HEMP, the fibre of the leaves of an East Indian plant, or the plant itself, *Sansiveria zeylanica*, order Liliaceae, so named from being made

by the natives into bowstrings. The plant is somewhat like a hyacinth in appearance, and has edible roots. The fibre is fine and silky, but very strong, and may become a valuable article in European manufacture.

BOX. See **BOX-TREE**.

BOX-ELDER, the ash-leaved maple (*Negundo aceroides*, or, more commonly now, *Acer Negundo*), a small but beautiful tree of the U. States, from which sugar is sometimes made.

BOYARS. See **BOIARS** in **SUPP.**

BRACKET, a short piece or combination of pieces, generally more or less triangular in outline, and projecting from a wall or other surface. They may be either of an ornamental order, as when designed to support a statue, a bust, or such like, or plain forms of carpentry, such as support shelves, &c. Brackets may also be used in connection with machinery, being attached to walls, beams, &c., to support a line of shafting.

BRADDON, MARY ELIZABETH, MRS. MAXWELL, a well-known novelist, born in London in 1837, daughter of a solicitor there. She received her education at home, and early showed signs of literary power. After publishing some poems and tales, in 1862 she brought out *Lady Audley's Secret*, the first of a series of clever sensational novels, among which may be mentioned *Aurora Floyd* (1862); *Eleanor's Victory* (1863); *Henry Dunbar* (1864); *Rupert Godwin* (1869); *Hostages to Fortune* (1875); *Ishmael* (1884); *The Fatal Three* (1888); *The Venetians* (1892); *Thou Art the Man* (1894); *Sons of Fire* (1895); *London Pride* (1896); *Under Love's Rule* (1897); *In High Places* (1898); and *Rough Justice* (1898). She conducted the *London magazine* *Belgravia* for some time, and some of her stories first appeared there. Her later works do not rely so much on sensational effects for their success as her earlier. She is the widow of Mr. John Maxwell, a well-known publisher.

BRADLAUGH, CHARLES, English secularist, atheist, and advocate of republicanism, was born in London on Sept. 28th, 1833. He made himself known by his writings and lectures, and more especially by his efforts to gain admission to parliament. Being elected for Northampton in 1880, he claimed the right to make affirmation simply, instead of taking the oath which members of parliament take before they can sit and vote, but being a professed atheist this right was denied him. Though he was repeatedly re-elected by the same constituency, the majority of the House of Commons continued to declare him disqualified for taking the oath or affirming; and it was only after the election of a new parliament in 1885 that he was allowed to take his seat without opposition as a representative of Northampton. He was editor of the *National Reformer*. He died on Jan. 30th, 1891. See the *Life* (2 vols., 1894) by his daughter and J. M. Robertson.

BRADWARDINE, THOMAS, 'Doctor Profundus', Archbishop of Canterbury, born about 1290, died 1349. He was distinguished for his varied learning, and more particularly for his treatise *De Causa Dei contra Pelagium*, an extensive work against the Pelagian heresy, for centuries a standard authority. He was chaplain and confessor to Edward III., whom he accompanied to France, being present at Cressy and the capture of Calais. Being appointed archbishop he hastened to England, but died of the black death on reaching London.

BRADYPUS. See **SLOTH**.

BRAEMAR, a mountainous district in the s.w. corner of Aberdeenshire. It contains part of the Grampian range with the heights of Ben Macdui,

Cairntoul, Lochnagar, &c. The district has some fine scenery, valleys and hillsides covered with birch and fir, but consists largely of deer-forests. The Queen's residence Balmoral Castle is here, on the banks of the Dee, midway between Ballater and Braemar village (Castleton of Braemar).

BRAHMO-SOMAJ, or the Theistic Church of India, was founded in 1830 by an enlightened Brahman, who sought to purify his religion from impurities and idolatries. This church, while accepting what religious truth the Vedas may contain, rejects the idea of their special infallibility, and founds its faith on principles of reason. The members do not in principle recognize the distinction of caste, and have made great efforts to weaken this as well as other prejudices amongst their countrymen.

BRAIN-CORAL, coral of the genus *Meandrina*, so called from its rounded shape and convolutions. See **SCLEODERMAT** and **SCLEODERMATIC CORAL**.

BRAINTREE, a town of England, in Essex, about 40 miles north-east of London, on the Great Eastern Railway. It stands high, is well drained and lighted, and amply supplied with water from an artesian well. It contains a church and several chapels, county court, corn exchange, a large school, market hall, &c., and there are crape, silk, and damask manufactures. Pop. (1891), 5303; (1901), 5330.

BRAKE. See **BRACKEN**.

BRAMBLING, or **BRAMBLE-FINCH** the mountain-finch (*Pringilla montifringilla*), larger than the chaffinch, and very like it. It breeds in the north of Scandinavia, and visits Britain and the south of Europe in winter.

BRANCHIÆ. See **GILLS** in **SUPP.**

BRANCHIOGASTEROPODA, gastropodous molluscs whose respiration is aquatic, being generally effected by means of external branches or gills. They include a great many animals with univalve shells, as whelks, limpets, cone-shells, periwinkles, cowries, &c., also sea-hares, sea-slugs, sea-monks, and the heteropoda.

BRANCO, RIO, a river of N. Brazil, a tributary of the Rio Negro. It is 400 miles in length, but 250 miles from its confluence with the Rio Negro navigation is blocked by falls.

BRANDENBURG, NW., a town of Germany, in Mecklenburg-Strelitz, with a grand ducal palace. Pop. (1895), 9719.

BRANDON, a rising town of Canada, in Manitoba, on the right bank of the Assiniboine, 132 miles west of Winnipeg. It is on the Canadian Pacific Railway, and has a trade in grain. Pop. (1896), 4591.

BRANKURSINE. See **ACANTHACEÆ**.

BRANT. See **BRANIT**.

BRANTFORD, a flourishing town of Canada, in the province of Ontario, on the Grand River (which is navigable), 24 miles s.w. of Hamilton. It has railway machine-shops, foundries, cotton and woollen mills, and other manufactures. It is an important railway junction, and carries on an active trade. Pop. (1891), 12,753; (1901), 16,619.

BRASSEUR DE BOURBOURG, CHARLES ÉTIENNE, French writer on American history, archaeology, and ethnology, born 1814, died 1874. He entered the priesthood, was sent to North America by the Propaganda, and lived and travelled here and in Central America for a number of years, partly in the performance of ecclesiastical functions. Among his works are *Histoire du Canada* (1852); *Histoire des Nations civilisées du Mexique et de l'Amérique Centrale* (1857-58); *Gramatica de la Lengua Quiche* (1862); *Monuments anciens du Mexique* (1864-66); *Études sur le Système graphique et la Langue des Mayas* (1869-70); &c.

BRASSEY, THOMAS, an English railway contractor, was born near Chester on Nov. 7th, 1805, and died at Hastings on Dec. 8th, 1870. His operations were on an immense scale, and extended to most of the European countries, as well as to America, India, and Australia, one of his greatest works being the Grand Trunk Railway of Canada, with the great bridge over the St. Lawrence at Montreal. He left a very large fortune.—His son, **THOMAS**, born at Stafford on Feb. 11th, 1836, since 1886 Baron Brassey, was civil lord of the admiralty from 1880 till 1884, and secretary in 1884–85. In 1895 he became governor of Victoria. He has taken a great interest in naval questions, and has published several works dealing with them. His other writings treat of political and labour questions, and include *Work and Wages*, and *Lectures on the Labour Question*. His first wife wrote *Voyage of the Sunbeam* and other works descriptive of yachting cruises and travels. She died on Oct. 14th, 1887.

BRAZIL-TEA, a name for maté.

BRAZZAVILLE, a town on the French side of the Congo at the lower end of Stanley Pool. It stands nearly opposite Leopoldville, in the Congo Free State.

BREAD-NUTS, the seeds of the *Brosimum aliostrum*, a tree of the same order as the bread-fruit (which see). The bread-nut tree is a native of Jamaica. Its wood, which resembles mahogany, is useful to cabinet-makers, and its nuts make a pleasant food, in taste not unlike hazel-nuts.

BREAD-ROOT, *Psoralea esculenta*, a leguminous plant of the United States, with edible farinaceous tubers.

BREEZE, **BREEZE-FLY**, a name given to various flies, otherwise called gadflies, horseflies, &c.

BREST-LITOWSKI, a fortified town of Russia, in the government of Grodno, on the Bug, 120 miles east of Warsaw, an important railway centre with a large trade. It is a fortress of the first rank. Pop. (1897), 46,542.

BRETTS AND SCOTS, LAWS OF, the name given in the thirteenth century to a code of laws in use among the Celtic tribes in Scotland, the Scots being the Celts north of the Forth and Clyde, and the Bretts being the remains of the British inhabitants of the kingdom of Cumbria, Cumbria, or Strathclyde, and Reged. Edward I. issued in 1305 an ordinance abolishing the usages of the Scots and Bretts. Only a fragment of them has been preserved.

BRETWALDA, a title applied to one of the Anglo-Saxon tribe-chiefs or kings, who it is supposed was from time to time chosen by the other chiefs, nobility, and ealdormen to be a sort of dictator in their wars with the Britons.

BRIALMONT, HENRI ALEXIS, Belgian military writer, born at Venlo on May 25th, 1821, entered the army in 1843 as lieutenant of engineers, and in 1877 became lieutenant-general. Among his works are *Considérations Politiques et Militaires sur la Belgique* (1851–52); *Précis d'Art Militaire* (1850); *Histoire du Duc de Wellington* (1856), translated into English by Gleig; *Études sur la Défense des États et sur la Fortification* (1863); and many works on fortification. He has fortified Namur, Boucharest, Liège, and other places.

BRIAR, BRIER, the wild rose. The well-known *briar-root* tobacco-pipes are not made from the briar, but from the root of a large kind of heath (*Fr. bruyère*, heath), *Erica arborea*, the tree-heath, a native of S. Europe, Corsica, Sardinia, Algeria, &c., with small, white, fragrant flowers.

BRIDGE OF ALLAN, a town of Scotland, in

Stirlingshire, on the border of Perthshire, on the banks of the Allan, about 8 miles north of Stirling, with which it is connected by the Caledonian Railway and a line of tramway cars. Owing to the mildness of its climate and the beauty of its situation Bridge of Allan is a favourite spring and autumn resort for invalids. It is built partly on a plateau of considerable height and partly on low ground on the banks of the river, and is finely laid out with trees and public walks. It has mineral wells. Pop. (1891), 3207; (1901), 3240.

BRIDGEWATER, a town of Nova Scotia, 60 miles south-west of Halifax. It stands on the river La Have in Lunenburg county, has railway offices and works, and carries on the lumber trade. Pop. (1891), 1814.

BRIDGMAN, LAURA, a blind deaf-mute, born in Hanover, New Hampshire, on Dec. 21st, 1829. Till the age of two years she was a bright active child, when a severe illness deprived her of the senses of sight, hearing, and smell, and partly also of that of taste. She was put under the care of Dr. Howe of Boston, and the history of the methods by which she was gradually taught to read, write, and eventually perform most of the ordinary duties, and even some of the accomplishments of life, is a very interesting one. She became herself a teacher of persons similarly afflicted, and led an active and useful life till her death on May 24th, 1889. See her biography by Mary S. Lamson (1878).

BRIER. See **BRIAR** in SUPP.

BRIERLEY HILL, a market-town of Staffordshire, England, on the Stour, 9 miles west of Birmingham. It has several churches, a town-hall, a free library, &c. The district abounds in coal, ironstone, and clay, and the inhabitants are mostly engaged in the iron rolling-mills, boiler-works, nail, chain, anchor, and spade making, bottle-works, potteries, and malting. Pop. (1891), 11,847; (1901), 12,040.

BRIGG, a town of England in Lincolnshire, giving name to a parliamentary division of the county. It is situated about 16 miles N.E. of Gainsborough, and has a trade in corn, timber, &c. Pop. (1891), 3100; (1901), 3137.

BRILLAT-SAVARIN, ANTHELME, a French author, who, although he wrote works on political economy, archaeology, and duelling, is now known only by his famous book on gastronomy, the *Physiologie du Goût*, published in 1825. He was born at Bellay in 1755, and after holding several honourable positions as a magistrate, died in Paris on Feb. 2nd, 1826.

BRINDABAN. See **BINDRABAN**.

BRISTLES, the stiff, coarse, glossy hairs of the hog and the wild boar, especially those growing on the back; extensively used by brushmakers, shoemakers, saddlers, &c., and chiefly imported from Russia and Germany. Russia supplies the finest qualities, which are worth about £50 or £60 per cwt.

BRISTOL-BOARD, a fine kind of pasteboard, smooth, and sometimes glazed, on the surface, employed in water-colour painting and other similar artistic work.

BRISTOL-STONE, rock-crystal, or Bristol-diamond, small, round crystals of quartz, found in the Clifton limestone, near the city of Bristol in England. They are used as ornaments.

BRITANNIA, the ancient name of Britain. Under the name of Britannia, Great Britain is personified as a helmeted woman seated on a globe or an insulated rock, leaning with one arm on a shield, and the other grasping a spear or trident.

BRITANNICUS, son of the Roman emperor Claudius, by Messalina, born about A.D. 42, poisoned A.D. 55. He was passed over by his father for the son

of his new wife Agrippina. This son became the emperor Nero, whose fears that he might be displaced by the natural successor of the late emperor caused him to murder Britannicus.

BRITISH CENTRAL AFRICA. See **CENTRAL AFRICA** (BRITISH) in SUPP.

BRITISH EAST AFRICA. See **EAST AFRICA** (BRITISH) in SUPP.

BRITISH GUM. See **DEXTRINE**.

BRITISH HONDURAS. See **HONDURAS**, **BRITISH**.

BRITISH LEGION, THE, a corps raised in Britain in 1835, numbering 10,000 men, under the command of General De Lacy Evans, to assist Queen Isabella of Spain in the war with Don Carlos. They rendered considerable assistance to the queen, defeating her Carlist rivals in several battles, notably at Ayetia, during the two years of their campaign. General Evans was himself defeated at Hernani in 1837, but he subsequently captured that place and also several others. He acted in conjunction with a naval force under Lord John Hay.

BRITZKA, a kind of small carriage, the head of which is always a movable calash, and having a place in front for the driver, and a seat behind for servants.

BRIXEN, an old town of Austria, in Tyrol, 104 miles from Vienna by rail, with a cathedral. Pop. (1890), 5248.

BRIZA, a genus of grasses, commonly called quaking-grass, maiden's-hair, or lady's-tresses. There are about thirty species, chiefly found in South America. Two (*B. media* and *B. minor*) are natives of Britain, these and other species are sometimes to be found in gardens as ornamental plants.

BROACH (French *broche*, a spit), a term sometimes applied to a spire that springs directly from a tower, there being no intermediate parapet.

BROAD CHURCH, a name given originally to a party in the Church of England, regarded as being midway between the Low Church or Evangelical section and the High Church or Ritualistic; now widely applied to the more tolerant and liberal section of any denomination.

BROCHS, the name commonly given to a certain class of edifices peculiar to Scotland. They occur in by far the largest numbers in the northern counties, including Orkney, Shetland, and the Western Isles, though they are found also in other parts of the country, more than three hundred in all being known. A broch, as described by Dr. Joseph Anderson, is a hollow circular tower of dry-built masonry, rarely more than 70 or less than 40 feet in total diameter, occasionally at least 50 feet high, and inclosing a circular court or area from 25 to 45 feet in diameter. The wall, which may be from 9 to 20 feet thick, is carried up solid for about 10 feet, except where it is pierced by the narrow passage giving entrance to the interior court, or where chambers are hollowed within its thickness and opening off the court. Above this height there are horizontal galleries in the thickness of the wall, each about 6 feet high and 3 feet wide, running completely round the tower, except where they are crossed by the stair that gives access to them, and having peculiarly constructed windows placed above each other, and all looking into the central area. The only external opening is that of the narrow entrance passage, forming a doorway about 5 or 6 feet high, and rarely more than 3 feet wide. The passage itself varies from 9 to 18 feet in length, and about 4 feet from its outer entrance to the place where the door—probably a slab of stone—was placed, and where the masonry presents features intended to enable it to be securely fixed. Many of the brochs are built in positions naturally strong, such

as a precipitous eminence or a promontory projecting into a loch, and they are also defended by ditches and embankments, earthen ramparts, and dry stone walls. Hence it is clear that they were intended to serve as places of shelter and defence, and as they are generally planted in the neighbourhood of the best land in the districts where they are situated, no doubt they were designed to furnish a refuge for an agricultural population with their cattle and other belongings. For this purpose they are admirably contrived, as they form a series of strongholds that could only be reduced by a regular siege, the inmates being safe against missiles and even against fire, from the height and strength of the walls. Provided with a sufficiency of food, and obtaining water from a well inside the inclosure, as was often the case in the brochs, the people who sheltered could hold out for an indefinite time. The relics found in the brochs, like the structures themselves, are decided by antiquaries to be Celtic in character, and to belong to post-Roman times. The brochs were probably built in most cases as places of refuge from the Scandinavian vikings that for centuries were a scourge to many of the European coasts, but little or nothing of their history is known. The relics include swords, spears, knives, axes, and chisels of iron, with rings, bracelets, pins, and other articles of bronze or of brass. Numerous articles made of the bones and horns of animals are also found in the brochs, with implements made of stone—querns, mortars, pestles, bowls and cups, lamps, &c. Pottery of various kinds was common. Spinning and weaving were evidently practised. Agriculture, hunting, and fishing furnished a subsistence; and animal food was furnished by the stag, the roe, the reindeer, the ox, sheep, goat, and pig, the whale, porpoise, cod, haddock, and other denizens of the sea.

BROCKHAUS, FRIEDRICH ARNOLD, founder of the eminent German publishing house still carried on by his grandson, was born 1772, died in 1828. In 1811 he settled at Altenberg, where the first edition of the *Conversations-Lexikon* was completed, 1810-11. The business rapidly extended, and he removed to Leipzig in 1817. There are now chief branches in Berlin and Vienna, and among the literary undertakings of the house have been several important critical periodicals and some large historical and bibliographical works. The *Conversations-Lexikon* distinctively associated with the name of Brockhaus has now reached a fourteenth edition.

BROCKTON, a town of the United States, in Plymouth co., Massachusetts, about 20 miles south of Boston. It has extensive manufactures of boots and shoes. Pop. (1890), 27,294.

BROGUE (Ir. and Gael. *bróg*), a coarse and light kind of shoe made of raw or half-tanned leather, of one entire piece, and gathered round the foot by a thong, formerly worn in Ireland and the Highlands of Scotland. The term is also used of the mode of pronunciation peculiar to the Irish, but whether the word brogue in this sense is the same as in the other is doubtful.

BROKEN HILL, a town in the western part of New South Wales, at the south of Stanley Range, about 925 miles west of Sydney. It stands in a district which contains many silver mines, and asbestos, lead, gold, copper, &c., are also found here. One of the silver mines, the Proprietary, is the most productive in the world. It is connected with Silvertown and Adelaide by rail. Pop. (1891), 18,530; (1901), 27,518.

BROKEN-WIND, a disease in horses, often accompanied with an enlargement of the lungs and heart, which disables them for bearing fatigue. In this disease the expiration of the air from the lungs

occupies double the time that the inspiration of it does; it requires also two efforts rapidly succeeding each other, attended by a slight spasmodic action, in order fully to accomplish it. The disease is caused by rupture of the air-cells, and there is no known cure for it.

BROKERAGE. See **BROKER**.

BROME, ALEXANDER, minor English poet and dramatist, born 1620, died 1666. He seems to have been a lawyer by profession, and at one time attorney to the court. He is best known as the author of many royalist songs and epigrams. He published *The Cunning Lovers*, a comedy (1654); *Fancy's Festivals* (1657); *Songs and Poems* (1661); Translation of Horace (1666).

BROME-GRASS, the name given to grasses of the genus *Bromus*. Nearly 200 species have been described, occurring both in the Old and the New World. Of these eight are enumerated by British botanists; they are known by having their spikelets many-flowered, two awnless glumes to each floret, two pales or valves, the lowermost of which has a rough, straight, rigid awn proceeding from below the tip of the valve. They are not held in much estimation by the farmer, but an Australian species, *B. Schraderi*, is strongly recommended as a forage plant.

BRONCHI, the two branches into which the trachea or windpipe divides in the chest, one going to the right lung, the other to the left, and ramifying into innumerable smaller tubes—the *bronchial tubes*. See **LUNGS**.

BRONCHOCELE. See **GOITRE**.

BRONTOSAURUS, a gigantic reptilian animal, of the order Dinosauria, found fossil in secondary strata of the Rocky Mountains, having a long neck and tail, a very small head, and strong limbs. It seems to have lived in swampy localities, and to have been herbivorous. Living it must have weighed between 20 and 30 tons.

BRONZE-WING, a name for certain species of Australian pigeons, chiefly of the genus *Phaps*, distinguished by the bronze colour of their plumage. The common bronze-winged ground-dove (*P. chalcopetra*) abounds in all the Australian colonies, and is a plump bird, often weighing a pound, much esteemed for table.

BROOKE, Rev. STOFFORD AUGUSTUS, a distinguished author in various fields, was born in 1832 at Letterkenny, Donegal. He received his early education at Kildermunster and Kingstown, and after a brilliant course at Trinity College, Dublin, where he took first the degree of B.A. and then that of M.A., he was ordained in 1857. From that year till 1859 he officiated as curate of St. Matthew's, Marylebone (London); and in 1876, after having held various other clerical appointments, he became minister of Bedford Chapel, Bloomsbury, where he officiated till his retirement from regular ministerial work in 1894. In 1872 he was appointed one of the chaplains-in-ordinary to the queen. In 1880 he seceded from the Church of England because he could no longer believe some of the cardinal doctrines of the church, but till 1894 he still continued to occupy the same pulpit, Bedford Chapel being private property. Mr. Brooke has gained a high reputation as a preacher and writer on religious subjects, and also as a poet, but more especially as a literary critic and historian of English literature. His chief works are *Life and Letters of the late Frederick W. Robertson of Brighton* (1865; originally in two vols., subsequently in one); *Christ in Modern Life* (1872); *Theology in the English Poets* (1874); *Primer of English Literature* (1876), an admirable little work; *Riquet of the Tuft* (1880), a

love drama; *The Early Life of Jesus* (1888); *Poems* (1888); *History of Early English Literature*: from its beginnings to the accession of Alfred (1892; 2 vols.), the only work in English treating adequately its special subject; *Tennyson: His Art and Relations to Modern Life* (1894); *The English Poets from Blake to Tennyson* (1894); *Jesus and Modern Thought* (1894); *The Old Testament and Modern Life* (1898); *The Gospel of Joy* (1898); besides several volumes of sermons.

BROOKLIME (*Veronica Beccabunga*), a European plant, with blue flowers, common in ditches and wet places in Britain, a species of speedwell. It is sometimes used in salads.

BROOM-CORN, BROOM-GRASS (*Sorghum vulgare*, millet or Guinea-corn), a plant of the order of grasses, with a jointed stem, rising to the height of 8 or 10 feet, extensively cultivated in N. America, where the branched panicles are made into carpet-brooms and clothes-brushes. The seed is used for feeding poultry, cattle, &c.

BROOM-RAPE. See **OROBANCHACEÆ**.

BROSIMUM. See **BREAD-NUTS** in **SUPP.**

BROUGHAM, a close four-wheeled carriage, with a single inside seat for two persons, glazed in front and with a raised driver's seat, named after, and apparently invented by, Lord Brougham.

BROUGHAM, JOHN, actor and dramatist, born in Dublin on May 9th, 1810; died in New York on June 7th, 1880. He was at first a student of surgery, but when thrown on his own resources through the death of an uncle he adopted the stage as a profession. After a short experience as dramatist, actor, and manager, he went to America in 1842. Eighteen years later he returned to England, but in 1865 he again went to the United States, where he remained till his death. He wrote upwards of seventy-five pieces, including *The Game of Life*, *Romance and Reality*, *Love's Livery*, *The Duke's Motto*, &c., and contributed largely to periodicals. He was well known as an actor both in England and in America.

BROUGHTON, RHODA, novelist, was born in North Wales on Nov. 29, 1840, her father being a clergyman. Her chief works are *Cometh up as a Flower* (1867); *Not Wisely but Too Well* (1867); *Good-bye, Sweetheart*, *Good-bye* (1872); *Nancy* (1873); *Scylla or Charybdis?* (1896); and *Dear Faustina* (1897). The cleverness and vigour of her earlier novels are not well maintained in her more recent ones.

BROUSSONETIA, a genus of trees. See **MULBERRY**.

BROWN, a colour which may be regarded as a mixture of red and black, or of red, black, and yellow. There are various brown pigments, mostly of mineral origin, as bistre, umber, cappegh brown, &c.

BROWN, FORB. MADOX, English painter, grandson of Dr. John Brown of Edinburgh, the author of the Brunonian system of medicine, was born at Calais on April 16th, 1821, and died at London on Oct. 6th, 1893. He studied at Bruges, Ghent, and Antwerp, and after a three years' residence in Paris he came to England about 1845. In 1844 and 1845 he contributed (unsuccessfully) cartoons of the Finding of the Body of Harold, Justice, and other subjects to the competitive exhibition for the frescoes of the Houses of Parliament. In 1865 he opened in London an exhibition of many of his pictures, including *The Last of England* (1852); *The Autumn Afternoon*; and *Work* (1865); the last-named having occupied him for several years. Only a month before his death he completed the last of the twelve Manchester town-hall frescoes, on which he had been engaged for a long time. Among his other works

are Lear and Cordelia (1849); *Pretty Baa-Lambe* (1851); *Chaucer at the Court of Edward III.* (1851); and *Cordelia's Portion*. He is generally rated as a pre-Raphaelite, but though a close intimacy existed between him and the brotherhood, he never actually joined them.—His son, OLIVER Madox BROWN (born 1855, died 1874), from early boyhood showed remarkable capacity both in painting and literature, especially prose fiction and poetry. His two most promising pictures were *The Tempest—Prospero* and *the Infant Miranda* (exhibited in 1871 at the International Exhibition, South Kensington), and *A Scene from Silas Marner* (1872). Gabriel Denver (1873), and some other unfinished novels, besides sonnets and other poems, show wonderful literary power in one so young. His *Literary Romances* were published in 1876.

BROWN, JOHN, M.D., a genial essayist, was born at Biggar, 22nd Sept. 1810. He was the great grandson of Dr. Brown of Haddington, the well known theological writer, and son of the pastor of a Dissenting church in Edinburgh. Young Brown was educated at the high school and university, and after serving his medical apprenticeship under Prof. Syme he spent a year as an assistant surgeon at Chatham. Returning to Edinburgh he graduated as M.D., and began to practise as a physician. His leisure hours were devoted to literature, many of his contributions appearing in the *Edinburgh Medical Journal*, the *North British Review*, *Good Words*, and other periodicals. Some of these were published collectively in 1858, under the title of *Hæc Subsecivæ* ('leisure hours'); and others were collected after his death, the whole being published in three volumes under the same title. Several of his short tales (such as *Rab* and *his Friends*, *Our Dogs*, *Pet Marjorie*, *Jenna the Doorkeeper*), on which his fame chiefly rests, have been published separately. In 1874 the Edinburgh University made him honorary LL.D., and two years later he received a pension of £100 from the civil list. He died 11th May, 1882.

BROWN BESS, a name familiarly given to the old government regulation bronzed flint-lock musket formerly used in the British army.

BROWN COAL, a variety of *Lignite* (which see).

BROWNE, CHARLES FARHAM, an American humorist, better known as 'Artemus Ward', was born at Waterford, Maine, 1834, and died at Southampton, England, 1867. Originally a printer, he became editor of papers in Ohio, where his humorous letters became very popular. He contributed to the *New York Journal Vanity Fair* from its commencement, and latterly became its editor. On its failure he began lecturing in California and Utah in the States, and in England, where he contributed to *Punch*. His writings consist of letters and papers by 'Artemus Ward', a pretended exhibitor of wax figures and wild beasts, and are full of drollery and eccentricity. The chief of these are *Artemus Ward, His Book* (1862); *Artemus Ward in England* (1867); and *A. W. among the Mormons* (1866). He died from pulmonary consumption.

BROWNE, HABLOT KNIGHT, a celebrated designer of humorous and satirical subjects, and an etcher of considerable skill, better known by his pseudonym of Phiz, was born in London on June 15th, 1815. He was educated at a private school, and at an early age began to draw caricatures with great spirit. In 1835 he succeeded Seymour as the illustrator of Dickens's *Pickwick*, and so happy and successful was his pencil that he was engaged to illustrate *Nicholas Nickleby*, *Dombey & Son*, *Martin Chuzzlewit*, *David Copperfield*, and other works of that great novelist. He subsequently contributed many

graphic illustrations to the novels of Lever, Ainsworth, Scott (the *Abbotsford* edition of the *Waverley Novels*), and to an illustrated edition of *Byron*, besides sending many comic sketches to the illustrated serials of the time. He died at Hove, Brighton, 8th July, 1882.

BROWNE, ISAAC HAWKINS, English poet, born at Burton-on-Trent 1708, died 1760. He was educated at Trinity College, Cambridge, and called to the bar, but he did not practise. He wrote *Design and Beauty*. The *Type of Tobacco* (in which he imitates Pope, Young, Swift, and others); and a Latin poem, *De Animi Immortalitate*, modelled on *Lucertus* and *Virgil*. The last-named received high commendation from the scholars of his time, and has been several times translated into English. Browne had a good reputation as a wit and conversationalist.

BROWN SPAL, a name given to some crystallized varieties of dolomite tinged with peroxide of iron.

BROXBY TUN, a town of Scotland, Linlithgowshire, 11 miles west of Edinburgh, with shale-oil works, and coal mines. Pop. (1891), 5498.

BRUANG, the Malayan sun bear.

BRUCE, EDWARD, a brother of Robert I., who, after distinguishing himself in the war of independence, crossed in 1315 to Ireland to aid the native sept against the English. After many successes he was crowned king of Ireland at Carrickfergus, but fell in battle near Dundalk in 1318.

BRUEYS. See *BAUES*.

BRUNANBURGH, the scene of a battle in which Athelstan and the Anglo-Saxons defeated a force of Scots, Danes, &c., in 937, locality very doubtful. The battle forms the subject of one of the oldest English (Anglo-Saxon) poems.

BRUNEL, or BRUNI, a Malayan sultanate under British protection on the S.W. coast of Borneo, between Sarawak and British North Borneo, exporting sago, gutta-percha, rubber, &c.; pop. 50,000. Its capital, also called Brunei, is situated on the river of same name, about 14 miles from its mouth, the houses being mostly raised above the water on posts. It has a considerable trade, its population being 30,000 to 35,000.

BRUNI. See *BRUNEL* in *SUPP.*

BRUNSWICK BLACK, a varnish made from asphalt, oil, and turpentine, applied to cast-iron goods.

BRUNSWICK GREEN, a pigment consisting of copper oxychloride, prepared from copper filings or turnings by the action of sal-ammoniac. It may also be obtained by the action of bleaching powder on blue vitrol. The mineral *atacamite* is the same substance. *Chrome green* and *emerald green* are also known by this name.

BRUSH, a well-known implement used for various purposes. There are two chief varieties, those with stiff hair or fibres, and those with flexible. The former are made of hogs' bristles, whale-bone fibres, vegetable fibres of various kinds (brush-grass, palms, &c.), and sometimes wire is made to serve the same purpose. The latter are made of hogs' bristles, or of the hair of the camel, badger, squirrel, sable, goat, &c., and are chiefly used for painting, the smallest kinds being called *penels*.

BRUSH-GRASS (*Andropogon (Ergyus)*), a grass of South Europe, with stiff dry roots which are used for making brushes.

BRUSH-TURKEY. See *TALLEGALLA*.

BRUX, a town of Bohemia, on the Bieła, in the neighbourhood of which are extensive coal-fields, and the famous mineral springs of Sedeschütz, Seidlitz, and Püllna. Pop. (1890), 14,136.

BRYANT, WILLIAM CULLEN, an American poet, was born on the 3rd November, 1794, at Cummington, Western Massachusetts, where his father, a man of great literary culture, practised as a physician. Proving himself a precocious boy, he met with every encouragement from his father to write verses, which he began to do at the age of nine. He prepared, when he was but fourteen, a collection of poems, which were published at Boston in 1809. In that volume appeared *The Embargo*, the only poem dealing with the politics of the day he ever wrote. In the following year Bryant entered Williams College as a student of law, but left without taking a degree in 1815, when he was admitted to the bar. In that year he became a contributor to the *North American Review*, in which appeared the following year his *Thanatopsis*, a poem in blank verse, which received much laudatory criticism. Six years later he published a second collection of poems, which brought him into real fame. The principal item in this collection, *The Ages*, is a didactic poem, in which he sketches the past progress of the world, concluding with a glowing picture of America, and its occupation by the new race. He definitely abandoned law for literature in 1825, and went to New York, where he founded the *New York Review*, and a year after became the editor of the *Evening Post*, an old established paper with which he was connected till the time of his death. In 1832 he issued another collection of poems, which was republished in Great Britain with a preface by Washington Irving. In the summer of 1834, accompanied by his family, he came to Europe, and travelled through England, France, Germany, and Italy, remaining in the latter country for a considerable time. In 1845 he again visited Europe, repeating his excursion in 1849, when he extended his journey to Egypt and the Holy Land. The incidents of these and subsequent journeys both in Europe and America were described in letters written to the *Evening Post*, which were reprinted in separate volumes entitled *Letters of a Traveller*, and *Letters from Spain and other Countries*. A complete edition of his poems up to 1855 was published in that year, and in 1863 appeared a small volume entitled *Thirty Poems*. His last works of importance are his translations of the *Iliad* (1870) and the *Odyssey* (1872), translations which many American critics rank above any that had hitherto appeared in the English language. Early in 1878 appeared *The Flood of Years*, his last poem of any great length, in which the poet, in strains that remind the reader of *Thanatopsis*, reviews the life of man as the ridge of a wave ever hurrying on to oblivion the forms that appear on its surface but for a moment, concluding, however, with the expression of a confident hope in the future of mankind, even though the present is most dark and drear. Many of the latter years of his vigorous, active life were spent in the beautiful village of Roslyn, near New York. On the occasion of uncovering a statue to Mazzini (30th May, 1878) he had to stand uncovered for about an hour under a burning sun. On his way home he fell down some steps at a friend's house. This accident was followed by concussion of the brain, and on the 12th June he expired. At the time of his death he was engaged, in conjunction with Mr. Sydney Howard Gay, in a popular history of the United States, the first volume of which appeared in 1876. He has sometimes been called the American Wordsworth, and there is certainly in Bryant a distinct affinity to the didactic side of the English poet's mind. His style, both in poetry and in prose, is remarkably clear, simple, and finished, in the former occasionally perhaps a little bald.

BRYCE, JAMES, English historian and politician,

was born at Belfast on May 10th, 1838, his father, James Bryce, LL.D., being a Scotsman well known as a distinguished teacher and geologist, and a master in the high school of Glasgow from 1846 to 1874. He received his education firstly at the high school and University of Glasgow, and latterly at Trinity College, Oxford, where he graduated B.A. with a double first-class in 1862, being in the same year elected a fellow of Oriel College. In 1867 he became a barrister of Lincoln's Inn. From 1870 till his resignation in 1893, he was regius professor of civil law at Oxford. He entered Parliament in 1880 as member for the Tower Hamlets division of London, and since 1885 he has represented South Aberdeen as a Liberal and Home Ruler. He was chancellor of the duchy of Lancaster and a member of the cabinet in the Liberal ministry of 1892, and two years later he became president of the Board of Trade, a post which he held till the change of government ensuing upon the general election of 1895. He is D.C.L. of Oxford, LL.D. of Edinburgh and Glasgow; in 1894 he was elected a fellow of the Royal Society, and many foreign honours have been conferred on him. His two most important works are *The Holy Roman Empire* (1864, 12th ed. 1895, trans. into German 1873, Italian 1886, French 1889) and *The American Commonwealth* (1888, 3 vols.), a very full exposition of the American constitution, system of government and administration, political machinery, &c. He has also written *Transcaucasia and Ararat* (1877), a book of travel; *Impressions of South Africa* (1897); and a large number of magazine articles.

BRYONY (*Bryonia*), a genus of plants of the natural order Cucurbitaceae, comprising a great number of species spread over all the warm and temperate regions of the globe. About thirty species are cultivated in European gardens, of which two, *B. dioica* and *B. alba*, are indigenous. They are herbaceous, annual or perennial, hairy or scabrous. *B. dioica*, or common bryony, is the only representative of its order in Great Britain. The leaves are opposite, cordate, palmate, angular, or trifid, flowers axillary in bunches, berries red and poisonous. The roots of many species, particularly of the two named, are thick and fleshy and possess strong cathartic properties. The so-called black bryony of Britain (*Tamus communis*) belongs to a different natural order, that of the Yams. It has cordate leaves, greenish flowers, red berries, and a black fleshy root.

BUANSUAH (*Cyon primævus*), a wild dog of Northern India, supposed by some to be the original type of the dog tribe. It is of a reddish-brown colour, and closely resembles the jackal. They hunt in packs of from six to thirty, both by day and by night.

BUBALINE ANTELOPE (*Bubalis mauritanica*), an ox-like antelope of North Africa, of a yellowish-brown colour, with horns at first pointing forward and outward, and then turning backward. It inhabits the desert tracts.

BUBASTIS, an ancient Egyptian town, so named from the goddess Bast, supposed to answer to the Greek Artemis or Diana. The cat was sacred to her, and the Bubasteia, or festivals of the goddess, were the largest and most important of the Egyptian festivals.

BUBO, an inflammatory swelling of a lymphatic gland, usually occurring in the groin, but also elsewhere, especially in the arm-pit. They are common accompaniments of venereal diseases and plague.

BUBONIC PLAGUE, a malignant disease that has recently raged in Bombay, Poona, and other places in India, apparently a form or variety of the

disease ordinarily known as plague, of which buboes are a common accompaniment. Haffkine's system of protective inoculation has been found very effective in reducing the mortality caused by the disease. See PLAGUE.

BUGARAMANGA, capital of the department of Santander, in Colombia, South America, 185 miles N.W. of Bogota. It is an important coffee centre, and in the neighbourhood are mines of gold, copper, and iron. Pop. about 12,000.

BUGCONIDÆ. See BARBERS.

BUCHANAN, ROBERT, an English poet and novelist, born at Caverswall, Staffordshire, on Aug. 18th, 1841, and educated in Glasgow, where his father was a newspaper proprietor and journalist. He went to London in 1860, and has since produced many works both in prose and verse. His earliest volumes of verse—*Undertones* (1863), *Idylls and Legends of Inverburn* (1865), and *London Poesies* (1866)—gained him a good reputation for truth, simplicity, humour, and pathos, and he has since produced various volumes of poetry which have been no less well received, such as *Wayside Poems* (1866); *North Coast and other Poems* (1867); *Book of Orm*, the *Celt* (1868); *The Drama of Kings* (1871); *St. Abe and his Seven Wives*, a satire on Mormon life published anonymously (1871); *Ballads of Life, Love, and Humour* (1882); *The City of Dream* (1888); *The Wandering Jew* (1893). He has also written novels—*The Shadow of the Sword* (1876); *The Child of Nature* (1879); *God and the Man* (1881); *Foxglove Manor*, &c.; and a number of plays, including *A Man's Shadow* (1890) and *Dick Sheridan* (1891). He also wrote an admirable *Life of the poet David Gray*. He died at Streatham on June 10, 1901.

BUCHHOLZ, a town of Saxony, on the Selma, about a mile from Annaberg, with extensive manufactures of laces, trimmings, &c. Pop. (1895), 7991.

BUCHT. See BUCK in SUPR.

BUCKEYE, an American name for certain species of horse-chestnuts.

BUCK-HOUND, a kind of hound similar to, but smaller than a stag-hound, once commonly used in Britain for hunting bucks. The Master of the Buck-hounds is still the title of an officer of the royal household in England.

BUCKIE, an important fishing-town on the coast of Banffshire, Scotland, with a good harbour, and railway connection both with the north and with the south. Pop. (1891), 5849; (1901), 6541.

BUCKLAND, FRANCIS TREVELYAN, naturalist, son of the Rev. Dean Buckland, was born at Oxford on 17th December, 1826. He graduated at Christ Church, Oxford, and having studied medicine in Paris and London, he was for some time house surgeon to St. George's Hospital, when he joined the 2nd Life Guards as assistant surgeon, a post which he held for nine years. His strong passion for natural history soon absorbed all his thoughts, and he became a constant contributor to the *Field* and other periodicals. Latterly he devoted himself with enthusiasm to pisciculture, a subject on which he was long the leading authority. His advice on the subject was sought by several foreign governments, and he was the means of introducing salmon and trout into the Australian and New Zealand waters. He was appointed inspector of salmon fisheries in 1867, and his reports as commissioner led to the passing of several useful acts of parliament. Besides a great quantity of pleasant gossiping articles contributed to various periodicals, he published *Curiosities of Natural History* (4 vols., 1857-72); a *Familiar History of British Fishes* (1881); the *Logbook of a Fisherman and Zoologist* (1875); &c. He died in London, 19th December, 1880.

BUCKRAM, a coarse textile fabric stiffened with glue and used in garments to give them, or keep them, in the form intended.

BUCK-SHOT, a kind of large leaden shot used for killing deer or other large game.

BUCKSKIN, a kind of soft leather of a yellowish or grayish colour, made originally from deer skins, but now usually from sheep skins. The softness which is its chief characteristic is imparted by urine, oil or brains in dressing it. The name is also given to a kind of twilled woollen cloth without a pile or 'face'.

BUCKU, the name of several plants belonging to the *Cajup* Colony, genus *Bursera*, order Rutaceæ, used in medicine, in the form of a powder or tincture, in disorders of the utero-genital organs.

BUCCAZZÀ, a town of Austria, in Galizia, on the Stripsa, a tributary of the Danister, 90 miles south-east of Lemberg, with which it is connected by rail. Pop. (1890), 11,300.

BUDAU, a town of India, in the North-west Province, the capital of a district of the same name in the P. L. and division, some 35 miles south-west of Bareilly, consisting of an old and a new town, the former partly surrounded by ancient ramparts; there is a handsome mosque, American mission, &c. Pop. (1891), 35,372.

BUFFALO-BERRY (*Shepherdia argentea*), a shrub of the elder family, a native of the States and Canada, with lanceolate silvery leaves and dense clusters of bright-red acid berries about the size of currants, which are made into preserves and used in various ways.

BUFFALO GRASS (*Tripsacum dactyloides*), a strong-growing N. American grass, so called from having formed a large part of the food of the buffalo, and said to have excellent fattening properties; called also *Gama-grass*.

BUFFER, any apparatus for deadening the concussion between a moving body and the one on which it strikes. In railway-carriages they are placed in pairs at each end, and are fastened by rods to springs under the framework to deaden the concussions caused when the velocity of part of the train is checked.

BUGGY, a name given to several species of carriages or gigs; in England, a light one-horse two-wheeled vehicle without a hood; in the U. States, a light one-horse four-wheeled vehicle with or without a hood or top; in India, a gig with a large hood to screen those who travel in it from the sun's rays.

BUGLE. See HORN.

BUGLE, the common name for *Alyssa*, a genus of labiate plants. Two of the species are British, *A. reptans*, a hedge-side plant with dark leaves and purplish flowers, formerly held in high esteem as an application to wounds; and *A. Chamaecytis*, Yellow Bugle, a plant which grows in sandy fields.

BURNSTONE, *BURNSTONE*, a name given to certain siliceous or siliceo-calcareous stones, whose dressed surfaces present a burr or keen cutting texture, whence they are much used for millstones. The most esteemed varieties are obtained from the upper fresh-water beds of the Paris basin, and from the Eocene strata of South America.

BUILDING LEASE, a lease of land for a long term of years, usually 99 years, at a rent called a ground-rent, the lessee covenanting to erect certain edifices thereon, and to maintain the same during the term. At the expiration of the lease the houses built become the absolute property of the landlord.

BUTENZORG ('without care'), a favourite residential town in the island of Java, about 36 miles south of Batavia, with which it is connected

by rail. It contains a fine palace of the governor-general of the Dutch East Indies, celebrated botanic gardens, &c.

BULAU, or **TYKUS**, an animal of the mole family (Talpidæ) and genus *Gymnura* (*G. Raflesii*), a native of Sumatra and Malacca, bearing a considerable resemblance to the opossum. The muzzle is much prolonged, the fur pierced by a number of long hairs or bristles, the tail naked, and it is possessed of glands which secrete a kind of musk.

BULBUL, the Persian name of the nightingale, or a species of nightingale, rendered familiar in English poetry by Moore, Byron, and others. The same name is also given in southern and south-western Asia to sundry other birds. Ornithologists give the name *bulbul* to any bird of the family Pycnonotidæ.

BULHAR, a town on the southern coast of the Gulf of Aden, in British Somaliland, between Berbera and Zeila. It is an outlet for the produce of the interior, the chief exports being hides, ostrich feathers, cattle, sheep, and gum. Pop. 5000.

BULL, **OLE BURNEMANN**, famous Norwegian violinist, was born at Bergen on Feb. 5th, 1810, and died near Bergen on Aug. 17th, 1880. He secured great triumphs both throughout Europe and in America by his wonderful playing. He lost all his money in a scheme to found a colony of his countrymen in Pennsylvania, and had to take again to his violin to repair his broken fortunes. He afterwards settled down at Cambridge, Mass., and had also a summer residence in Norway, where he died.

BULLACE, a kind of wild plum (*Prunus insititia*) common in many parts of England, but rare in Scotland, used for making jam, &c.

BULLER, **SIR RICHARD HENRY**, English general, was born in Devonshire in 1839, and joined the 60th Rifles as ensign in 1858. In 1862 he was promoted to the rank of lieutenant, and eight years later to that of captain. He was a major in 1874, lieutenant-colonel in 1878, colonel in 1879, and major-general in 1884. He served with his regiment in the Chinese campaign of 1860, and on the Red River expedition in 1870. During the Ashantee war he acted as quartermaster-general and head of the intelligence department, and gained special mention for his behaviour in several engagements. He also served with distinction during the Kaffir war of 1878, and the Victoria Cross was conferred on him in 1879 for his gallant conduct in saving the lives of two officers and a trooper of the Frontier Light Horse during the retreat at Inkhloane in the Zulu campaign. He also served as chief of the staff to Sir Evelyn Wood in the war against the Boers in 1881, and in Egypt in the following year, gaining special distinction for his services at Kassassin, Tel-el-Kebir, and elsewhere. In the Soudan campaign of 1884-85 he was chief of the staff to Lord Wolseley, and he was in command at the battle of Abu-klea when Sir Herbert Stewart had been wounded. From 1887 till 1890 he held the post of quartermaster-general of the army, and from 1890 till 1897 he acted as adjutant-general to the forces. In 1886-87 he was under-secretary to the lord-lieutenant of Ireland, and in 1891 he was promoted to the rank of lieutenant-general. He was created K.C.M.G. in 1882, K.C.B. in 1885, and G.C.B. in 1894. In 1899 he went to Natal as commander in the war with the Boer republics, and rendered valuable services in the relief of Ladysmith, &c.

BULLETTREE, or **BULLY-TREE** (*Minusops Balata* or *Sapota Mulleri*), a forest tree of Guiana and neighbouring regions, order Sapotaceæ, yielding an excellent gum (the concreted milky juice) known as *balata*, having properties giving it in some respects

an intermediate position between gutta-percha and india-rubber, and making it for certain industrial purposes more useful than either. (See *BALATA* in *SUPP.*) The timber of the tree also is valuable.

BULL RUN, a stream in the N.E. of Virginia, flowing into the Occoquan river, 14 miles from the Potomac; the scene of two great battles during the American civil war in which the Federals were defeated. The first battle was fought 21st July, 1861; and the second on 30th August, 1862.

BULLY-TREE. See *BULLETTREE* in *SUPP.*

BULOW, **HANS GUIDO VON**, pianist and composer, born at Dresden on Jan. 8th, 1830, studied law for a time, but adopted music as a profession. He studied the piano under Liszt, and made his first public appearance in 1852. In 1855 he became leading professor in the Conservatory at Berlin; in 1858 was appointed court pianist; and in 1867 he became musical director to the King of Bavaria. His compositions include overture and music to Julius Cæsar, The Minstrel's Curse, and Nirwana; songs, choruses, and pianoforte pieces. He was considered one of the first of pianists and orchestral conductors. He died in Cairo on Feb. 12th, 1894. His widow produced an edition of his Letters and Writings (3 vols., 1895-97).

BULRAMPUR, a town of India, in the Fyzabad division of Oudh, the residence of the Maharaja of Bulrampur. It has a trade in rice, &c., besides manufactures of cotton and other articles. Pop. (1891), 14,849.

BULSAR, a port and town in Surat district, Bombay, on the estuary of the Auranga, some 50 miles south of Surat, with which it has railway communication. It exports timber, and manufactures cloth, bricks, tiles, and pottery. Pop. (1891), 14,779.

BULUWAYO, or **BULAWAYO**, a rising town of S. Africa, in Southern Rhodesia (Matabeleland), 490 miles by rail north-east of Mafeking, about 240 miles south-west of Salisbury, with churches, schools, banks, hotels, telephones, &c. It was formerly the chief town of the Matabele tribe, and the royal kraal has been replaced by Government House, which communicates by an avenue about a mile and a half long with the town proper. It now has railway communication with Cape Town (1361 miles), and extensions north-east to Salisbury and north-west to Wankie on the Zambesi are proposed. Pop. (white), 4000.

BULWER, **SIR WILLIAM HENRY LYTTON EARLE**, **BARON DALLING** and **BULWER**, diplomatist and author, elder brother of Lord Lytton, the novelist, was born in London on Feb. 18th, 1801, and died at Naples on May 23rd, 1872. He was attached to the British embassies at Berlin, Brussels, and the Hague from 1827 to 1830, when he entered parliament. In 1837 he was sent as secretary of legation to Constantinople; subsequently he was minister at Madrid and Washington, and he succeeded Lord Stratford de Redcliffe as ambassador at the Porte (1858-65). He wrote, among other works, *France, Social, Literary, and Political*; *Life of Byron*; *Life of Palmerston*; and *Historical Characters*. He was raised to the peerage in 1871.

BUNDER-ABBAS. See *BENDER-ABBAS* in *SUPP.*

BUNSEN, **ROBERT WILHELM EBERARD**, an eminent German chemist, was born at Göttingen on Mar. 31st, 1811. He studied at Göttingen University, and at Paris, Berlin, and Vienna; was appointed professor at the Polytechnic Institute of Cassel, 1836; extraordinary professor at the University of Marburg in 1838, and ordinary professor there in 1841; professor at Breslau in 1851;

and finally professor of experimental chemistry at Heidelberg in 1852. Among his many discoveries and inventions are the production of magnesium in quantities, magnesium light, spectrum analysis, and the electric pile and the burner which bear his name (see below). Among his works are *Chemische Analyse durch Spektralanalysen* (with Kirchhoff, 1861; new edn., 1896); *Gasometrische Methoden* (1857; English by Roscoe); and *Anleitung zur Analyse der Aachen und Mineralwasser* (1874). He retired from active teaching in 1889, and died on Aug. 16, 1899.

BUNSEN'S BURNER, a form of gas-burner especially adapted for heating, consisting of a tube, in which, by means of holes in the side, the gas becomes mixed with air before consumption, so that it gives a non-illuminating smokeless flame. Burners of this nature are part of the indispensable outfit of a chemical laboratory.

BUNTING, a name applied to different species of inaeosorial birds belonging to the section *Coronostes*, and included among the finches. The genus *Emberiza* is that to which the typical buntings belong. These birds inhabit both the Old and the New World. One special peculiarity is the presence of a knob or tubercle on the palate. The Yellow-hammer (which see) is included in this genus. So also is the Orlolan (which see), or Garden Bunting. The Common Bunting, *par excellence*, the *Emberiza miliaris* of the naturalist, is found in spring and summer in cornfields, and hence is also known as the Corn Bunting. The name 'Lark Bunting' is also given to it from its coloration resembling that of the lark. The food chiefly consists of seeds, especially of those belonging to various grasses. In autumn and winter the buntings assemble in large flocks, and, being fat and in good condition, are in great request as delicacies for the table. The song is harsh. The nest is built of grasses, moss, and hair, and is constructed on or near the ground. The eggs, numbering five, are gray-white in colour, tinted with red or purple. The Lapland Bunting, Snow Bunting, or Snow Fleck (*Plectrophanes nivalis*), is noticed in the article SNOW BUNTING.

BURBAGE, RICHARD, famous actor and contemporary of Shakspeare, was the son of James Burbage (died 1597), also an actor, and the first builder of a theatre in England. He was born about 1567, and died 1619. He was a member of the same company as Shakspeare, Fletcher, Hemming, Condell, and others, and filled all the greatest parts of the contemporary stage in turn. He was the original Hamlet, Lear, Othello, and Richard III., and played the leading parts in the plays of Beaumont and Fletcher, Ben Jonson, Webster, Marston, &c. Besides being an eminent actor, he seems to have been also a successful painter in oil colours.

BURDEKIN, a river of the N.Z. of Queensland, with a course of about 350 miles. With its affluents it waters a large extent of country, but it is useless for navigation.

BURGHLEY, BURLEIGH. See CROIL.

BURGUNDY PITCH, a resin got from the Norway spruce (*Abies excelsa*) and several other pines. It is used in medicine as a stimulating plaster. It takes its name from Burgundy in France, where it was first prepared.

BURITI, a South American palm (*Mauritia vinifera*) growing to the height of 100-150 feet, preferring marshy situations, and bearing an imposing crown of fan-shaped leaves. A sweet vinous liquor is prepared from the juice of the stem, as also from the fruit.

BURKE, ROBERT O'HARA, an Australian explorer, born in county Galway, Ireland, in 1820, and died

in Australia on June 28th, 1861. After serving in the Austrian army he went to Australia, and after seven years' service as inspector of police was appointed commander of an expedition to cross the continent of Australia from south to north. He and his associate Wills reached the tidal waters of the Flinders river, but both perished of starvation on the return journey.

BURLINGTON, a city of the United States, in Iowa, on the Mississippi, with a Baptist college, and manufactures of agricultural implements, &c. Pop. (1890), 22,565.—Also a city of New Jersey, on the Delaware, 7 miles above Philadelphia. Pop. (1890), 7264.

BURNABY, FREDERICK GUSTAVUS, English soldier and traveller, was born at Bedford on March 3rd, 1842, being a son of the Rev. G. A. Burnaby. He was educated at Bedford and Harrow, and entered the Royal Horse Guards in his eighteenth year as cornet. In 1867 he became lieutenant, in 1866 captain, major in 1879, lieutenant-colonel in 1880, and finally, in 1881, he was appointed colonel, a rank which he held till his death, four years later. In 1875 he made his famous ride to Khiva—a journey that presented great difficulties. During the ride, which he undertook partly because he had learned that the Russian government kept Europeans out of Central Asia, he suffered severely from the intense cold prevailing at the time when he crossed the steppes. In 1876 he rode through Asiatic Turkey and Persia. Of both these journeys he published narratives, namely, *Ride to Khiva* (1876, eleventh edition 1877, new edition 1884), and *On Horseback through Asia Minor* (1877). In 1885 (Jan. 17), while serving as lieutenant-colonel of the Royal Horse Guards in the Egyptian campaign, he was killed at the battle of Abu-Klea.

BURNAND, FRANCIS COWLEY, editor of *Punch*, was born in November, 1836, and educated at Eton and Trinity College, Cambridge. He at first studied with a view to entering the Church of England, but when in 1858 he became a Roman Catholic he devoted himself to legal studies, and was called to the bar in 1862. By that year he had already achieved some success as a writer, and in consequence he seldom practised. After about a year's connection with *Fun* he joined the staff of *Punch* in 1863, becoming editor in 1880. His book, *Happy Thoughts*, republished from *Punch*, achieved considerable popularity, and went through several editions. Other successful productions of his are the extravaganzas, *New Light on Darkest Africa*, and *Ride to Khiva* (making fun out of H. M. Stanley and Colonel Burnaby respectively), and the parody on Ouida's novel, *Strathmore*, which he published under the title of *Strapmore*. Numerous plays have come from his pen, mostly of the nature of burlesques and light comedies, such as the plays *Black-eyed Susan* (a burlesque of Douglas Jerrold's drama) and the *Colonel*. In 1879 he issued a history of the *Amateur Dramatic Club*, which he had founded at Cambridge University. He collaborated with Sir A. Sullivan in *The Chieftain*, a play produced in 1894, and other works. He was knighted in 1902.

BURNE-JONES, SIR EDWARD, painter, born Aug. 28, 1833, at Birmingham, received his early education at King Edward's School there. In 1852 he went to Exeter College, Oxford, where he was a fellow-student of William Morris, and afterwards became acquainted with A. C. Swinburne (who dedicated his *Poems and Ballads* to him). His first intention was to enter the Church of England, and it was not till he had reached his twenty-second year that he seriously devoted himself to art studies; but, going to London in 1855, he came under the

influence of D. G. Rossetti and the Pre-Raphaelite movement, and soon attained considerable success in various departments of artistic work. In 1859 he set out on a journey through Italy in order to see the productions of the early Italian painters and sculptors, and on his return to England he gave in his stained-glass designs and his pictures splendid promise of his subsequent triumphs. In 1865 he began a series of illustrations to Morris's *Earthly Paradise*, and he also executed some seventy designs for the *Story of Cupid and Psyche*, besides pictures dealing with the same subject. He was elected a member of the Old Society of Painters in Water-colours in 1864, but withdrew from it in 1870, and from this year till 1877 he scarcely ever exhibited in London. In the Grosvenor Gallery exhibition of the latter year, however, his works formed the chief attraction. He received the Cross of the Legion of Honour in 1880, was elected in 1885 Associate of the Royal Academy, a position which he resigned in 1893 (having only exhibited one picture at the Academy, *The Depths of the Sea*), and he was created a baronet in 1894. He died in London on June 17th, 1898. His most important pictures are *Day, Night, Spring, Summer, Autumn, Winter* (1867-68); *The Wine of Circe* (1869); *Chant d'Amour* (1873); *Beguiling of Merlin* (1877), an illustration of Tennyson's *Merlin and Vivien*; *Six Days of Creation* (1877); *The Golden Stairs* (1880); *The Wheel of Fortune* (1883); *Wood Nymph*; *King Cophetua* (1884); *Laus Veneris*; *The Depths of the Sea* (1886); and *The Briar Rose* series (1890). He holds a specially high place as a designer for stained-glass windows, and in many other departments of decorative art. His leading characteristics as a painter are his fertile imagination and fine poetic feeling, qualities which no painter of the century has possessed in anything like the same degree. The old-world dreaminess of his work is finely aided by his wonderful power as a colourist. In common with his friends Morris and Rossetti he exercised a most potent influence on Victorian art.

BURNETT, Mrs. FRANCES HODGSON, novelist, was born in Manchester on Nov. 24, 1849. In 1865 she went to Tennessee with her parents, and whilst there she married in 1873 Dr. Swan M. Burnett, who is known as author and translator of some works on ophthalmology. Her first conspicuous literary success was *That Lass o' Lowrie's*, a story of collier life in her native county, which appeared originally in *Scribner's Magazine*, and in book form in 1877. Her other works, which usually appeared first in serial form, include *Theo. a Love Story* (1877); *Kathleen Mavourneen* (1879); *Haworth's*, a Novel (1879); *Louisiana* (1880); *Little Lord Fauntleroy* (1886), a story of child-life, which has had very great success both as novel and as drama; *Sara Crewe* (1888); *Two Little Pilgrims' Progress* (1895); *A Lady of Quality* (1896); *His Grace of Ormonde* (1897); and *The Captain's Youngest* (1898). Mrs. Burnett's work shows great versatility in the creation of character, and has but little of the sensational element.

BURNETT PRIZES, prizes established by a Mr. Burnett, merchant of Aberdeen, on his death in 1784. He left a fund from which were to be given every forty years two theological prizes (not less than £1200 and £400) for the best two essays in favour of the evidence that there is an all-powerful, wise, and good Being, and this independent of all revelation. The first competition was in 1815, when Dr. Brown, principal of Aberdeen University, gained the first prize, and Dr. John Bird Sumner, afterwards Archbishop of Canterbury, the second. In 1855 the first prize was adjudged to the Rev. R. A. Thompson, Lincolnshire, and the second prize to the Rev. Dr.

John Tulloch, afterwards principal of St. Mary's College, St. Andrews. The destination of the fund has latterly been altered by parliament, and courses of lectures are now delivered, the first, on light, being by Prof. Gabriel Stokes in 1883.

BURNETT'S DISINFECTING LIQUID, an antiseptic liquid and deodorizer prepared from chloride of zinc. It is useful in deodorizing sewage, bilge-water in ships, &c., and is found of service in the dissecting-room.

BURNS AND SCALDS are injuries produced by the application of excessive heat to the human body. They are generally dangerous in proportion to the extent of surface they cover, and a wide-spread scald may cause serious consequences on account of the nervous shock. Congestion of the brain, pneumonia, inflammation of the bowels, or lock-jaw may result from an extensive burn. Hence the treatment requires to be both local and constitutional. If there is shivering or exhaustion, hot brandy and water may be given with good effect, and if there is much pain, a sedative solution of opium. The local treatment consists in dredging the burn with fine wheat-flour and then wrapping it up in cotton-wool. An application of equal quantities of olive-oil and lime-water, called *carron-oil*, is much recommended by some, the part being afterwards covered by cotton-wool. The main thing is to keep the air from the injured part, and therefore, when a blister forms, although it may be pricked, the loose skin should not be removed.

BURNT-SIENNA, an ochreous earth known as *sienna earth* (*Terra di Sienna*) submitted to the action of fire, by which it is converted into a fine orange-brown pigment, used both in oil and water-colour painting.

BURNT-UMBER, a pigment of reddish-brown colour obtained by burning umber, a soft earthy mixture of the peroxides of iron and manganese, deriving its name from *Unbra* in Italy.

BURRITT, ELIUT, the 'learned blacksmith', as he was called, was born at New Britain, Connecticut, Dec. 8, 1810. He was apprenticed to a blacksmith, but, conceiving a strong desire for knowledge, he began to read English literature, and with great diligence and perseverance at length acquired proficiency not only in the ancient, but also most of the modern languages of Europe. He afterwards came into public notice as a lecturer on behalf of temperance, the abolition of slavery and war, &c., and founded papers, missions, and organizations to further these ends. In 1848 the first International Peace Congress was held under his guidance at Brussels. In 1865 he was consular agent at Birmingham. In 1868 he returned to live on his farm in America, and died March 7, 1879. His best-known writings are *Sparks from the Anvil*; *Thoughts and Things at Home and Abroad*; *Chips from Many Blocks*; &c.

BURRSTONE. See **BURRSTON** in SUPP.

BURTON, JOHN HILL, a Scottish historian and miscellaneous writer, the son of an English military officer, and of the daughter of an Aberdeenshire land-owner, was born at Aberdeen, 22nd Aug., 1809, and was educated at the grammar-school and Marischal College in that city. His father dying when the future historian was a boy, he had his own way to make. He resolved to devote himself to law, and passed for the Scottish bar in 1831. He never succeeded in gaining much practice, and soon turned his attention to literature. In 1833 we find him contributing to the *Westminster Review*, and he afterwards wrote for the *Edinburgh* and *North British Reviews*, and acted on the staff of the *Scottishman* newspaper. He edited, along with Sir John Bowring, an edition of Bentham's works, as well as an illustrative Benthamiana, with the aim of making more widely known the

opinions of the great apostle of Utilitarianism and Radicalism. His first original work of importance was the *Life and Correspondence of David Hume* (1846), followed next year by the *Lives of Lord Lovat and Duncan Forbes of Culloden*. In 1849 the Messrs. Chambers published his *Political and Social Economy*; in 1852 he compiled *Narratives from Criminal Trials in Scotland*. He commenced in 1853 the publication of his chief work, the *History of Scotland*, with two volumes covering the period from the Revolution of 1688 to the extinction of the last Jacobite rebellion in 1746. This was afterwards completed by seven volumes, commencing with *Agriicola's* invasion and ending with the Revolution of 1688. A second edition of the complete history was published in 8 vols. (1873). A series of literary and historical sketches contributed to *Blackwood's Magazine* formed the basis of two of his best-known books, *The Scot Abroad* and the *Bookhunter*. His last important historical work was the *History of the Reign of Queen Anne* (1880). In 1854 Mr. Burton was appointed secretary to the Scottish Prison Board, and he continued his connection with this department as a commissioner of prisons until his death, 10th August, 1881. The success of his Scottish History brought him the appointment of Historiographer Royal for Scotland, the degree of LL.D. from Edinburgh University, and that of D.C.L. from Oxford.

BUSBY, a military head-dress worn by hussars, artillerymen, and engineers, consisting of a fur hat, with a bag of the same colour as the facings of the regiment hanging from the top over the right side. The bag appears to be a relic of a Hungarian head-dress, from which a long padded bag hung over, and was attached to the right shoulder as a defence against sword-cuts.

BUSH-BUCK, a name given to several species of antelopes, especially to *Tragelaphus sylvaticus*, an antelope of South Africa, 4 feet long and 2½ feet high, with triangular sub-spiral horns. The male is dark sepia-brown and the female reddish-brown above; both are white below. The *white-backed bush-buck* is the *Cephalophus ruficinctus*, a white-backed antelope of Sierra Leone, with black, shining, pointed, and nearly straight horns, short slender limbs, sleek, glossy, deep-brown hair.

BUSH-HOG. See *BOSCH-VARK* in SUPP.

BUSH-PIG. See *BOSCH-VARK* in SUPP.

BUSHRANGERS, the name for desperadoes in Australia who, taking to the bush, supported themselves by levying contributions on the property of all and sundry within their reach. Considerable gangs of these lawless characters have sometimes collected, a body of fifty holding part of New South Wales in terror about 1830. A gang of four fell victims to justice in 1880, after having robbed a bank and committed other outrages. Since then little has been heard of outrages of this class.

BUSSU-PALM, the *Manicaria saccifera*, found in the swamps of the Amazon, whose stem is only 10 to 15 feet high, but whose leaves are often 30 feet long by 4 to 5 feet in breadth. These are used by the Indians for thatch, the spathe is used as bags, or, when cut longitudinally and stretched out, they form a coarse but strong kind of cloth.

BUTCHER-BIRD. See *SHRIKE*.

BUTLER, ALBAN, English Roman Catholic writer, born 1711, died 1773. He was educated at the English (R.C.) College, Douay, where he became professor first of philosophy and then of divinity; latterly he was president of the English college St. Omer. His *Lives of the Saints* (1750-59) is a monument of erudition which cost him thirty years' labour. Gibbon says of it: 'It is a work of merit;

—the sense and learning belong to the author; the prejudices are those of his profession'.

BUTLER, SIR WILLIAM FRANCIS, was born in Tipperary co., Ireland, in 1838. He was educated at Dublin, and joined the army in 1858 as ensign in the 69th Regiment. In 1863 he became lieutenant, nine years later captain, and in 1874 he was promoted to the rank of major. He served on the Red River expedition of 1870-71, and about the same time was sent on a special mission to the Soudan chawan territories. He accompanied the Ashantee expedition in 1874, and in 1879 acted as staff-officer in Natal. He also served in Egypt in 1882 and held important commands under Lord Wolseley in the Soudan campaign of 1884-85. In 1890-93 he was in command at Alexandria, and in 1892 he was raised to the rank of major-general. He has since had command of the second infantry brigade at Aldershot, and of the south-western district. He was made K.C.B. in 1886. In 1898-99 he was commander in chief in Cape Colony. In 1890 he assumed the command at Aldershot, and in 1890 he was promoted to the rank of lieutenant-general. His chief works are: *The Great Lion Land: A Narrative of Travel and Adventure in the North-west of America* (1872), *The Wild North Land* (1872); *Akimpoo* (1875), a story of the Ashantee war; and biographies of Charles George Gordon (1889), Sir Charles Napier (1891), and Sir George Colley (1899). In 1877 he married ELIZABETH SOUTHWICK DEN THOMSON, born about 1844 at Lausanne, and well known as a painter. She received her education in Italy, came to England in 1870, and first exhibited at the Royal Academy in 1873. Her Roll-call (1874) gained her a great reputation, and was purchased by the queen. Among her other pictures, which deal almost exclusively with military subjects are *Balaclava* (1876), *Imverman* (1877), *Defence of Rorke's Drift* (1881), *Flora's Etona* (1882), *The Charge of the Scots Greys at Waterloo* (1882), *Evicted* (1890), *Camel Corps* (1893), *Dawn of Waterloo* (1895), and *Steady the Drums and Fife* (1897).

BUTTEL-BUR (*Petasites vulgaris*), a British composite plant, with large rhubarb-like leaves and purplish flowers, growing by the side of streams, allied to colt's-foot. The flowers appear before the leaves.

BUTTERFLY-WEED, *Asclepias tuberosa* (see ASCLEPIAS), the pleurisy-root of America, where it has a considerable reputation as an article of the materia medica. It is an expectorant, a mild cathartic, and a diaphoretic, and is employed in incipient pulmonary affections, rheumatism, and dysentery.

BUTTER-NUT, the fruit of *Juglans cinerea*, or white walnut, an American tree, so called from the oil it contains. The tree bears a resemblance in its general appearance to the black walnut, but the wood is not so dark in colour. The same name is given to the nut of *Caryocar butyraceum* and *C. nuciferum* of South America, also known as *Suvarrow* or *Suvarra nut*.

BUTTER-TREE, a tree of West Africa discovered by Mungo Park in the Bambarra country. It belongs to the natural order Sapotaceae, and is called *Bassia Parkii*. It yields shea-butter, a product which is obtained by boiling the seeds, and is white, pleasant, and very nutritious. It forms an important commercial article in Africa, and keeps sweet a long time. *Bassia butyracea*, the *Maduoca* tree, yields a similar product, which is used as butter in Nepal. There are also one or two other butter-trees in India, such as *B. longifolia* and *B. latifolia*, both of which yield oil and have edible flowers.

BUTTERWORT (*Pinguicula*), a genus of plants

BUTTONWOOD—BYRON.

of the natural order Lentibulariaceae. The calyx is two-lipped, the lower lip bifold, the upper of three segments; corolla spurred, two-lipped and gaping. The species are small plants with only radical leaves, and are natives of bogs and marshes. The popular name is derived from the greasy appearance and feel of the foliage of the common species (*P. vulgaris*), which has the leaves covered with a viscid substance that serves to entangle flies, and thus to furnish the plant with part of its nutriment, since, like the sundew and others, the butterwort is an insectivorous plant. It is used by the Laplanders to curdle milk. The plant has pretty purple flowers, growing solitary on slender leafless stalks, and is found in abundance in mooses and moist localities in the northern parts of Britain and the rest of Europe. *P. grandifolia* has much larger flowers of a deep-purple colour, and is a native of the south of Ireland and of France. *P. alpina* has a small yellowish flower, and is found in Skye and Ross, being apparently peculiar to Scotland.

BUTTONWOOD, a name often given to the N. American plane (*Platanus occidentalis*).

BUTYRIC ACID ($C_4H_8O_2$), a fatty acid obtained from butter; it also occurs in perspiration, cod-liver oil, &c. Butyric acid is a colourless liquid, having a smell like that of rancid butter; its taste is acrid and biting, with a sweetish after-taste.

BUTYRIC ETHER, a substance obtained from butyric acid, with the flavour of pine-apples, used in flavouring confectionery, as an ingredient in perfumes, &c.

BUXAR, BAKAR, or BAKSAR, a town of Bengal, on the Ganges, 350 miles n.w. of Calcutta. It has a station on the East Indian Railway, and trades largely in sugar, cotton, piece-goods, and salt. Sir H. Munro's victory here in 1764 finally brought the Lower Provinces of Bengal under British rule. Pop. (1891), 15,506.

BUXUS. See Box-tree.

BUYUKDEREH, a town on the European shore of the Bosphorus, a few miles from Constantinople. It is famous for its poetry, and is a favourite residence of the Christian ambassadors.

BYRON, JOHN, English poet and stenographer, was born near Manchester on Feb. 29th, 1802, and died on Sept. 26th, 1868. He was educated at Merchant Taylors' School and Trinity College, Cambridge, and for some time studied medicine, but his chief means of livelihood for many years, till he inherited the family estates in 1740, was teaching shorthand on a system invented by himself. He was on friendly terms with many of the eminent men of his time. In politics he was a strong Jacobite throughout his whole career. His earliest writings were a few papers to the Spectator; his poems (collected in 1778) were chiefly humorous and satirical, and show remarkable facility in rhyming. An edition in four vols. by A. W. Ward appeared in 1894-95.

BYRON, HENRY JAMES, English dramatist and actor, was born in Manchester in Jan., 1834, and died in London on April 11th, 1884. He studied at first for the medical profession, and afterwards for the bar, but his passion for the stage caused him to abandon them. He was the first editor of Fun, and also started another paper entitled the Comic Times, which soon ceased to appear. Many of his chief plays were produced at various theatres with which he was connected as manager, but they were not financially successful. He wrote an immense number of pieces, including a great many farces, burlesques, and extravaganzas, besides comedies or domestic dramas, such as Cyril's Success, probably his best work; Dearer than Life; Blow for Blow; Uncle Dick's Darling; the Prompter's Box; Partners for Life; and Our Boys, which had a run of four years and three months, the longest on record.